BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 10 1948

SURGICAL TEACHING IN AMERICA*

BY

A. E. PORRITT, C.B.E., M.Ch., F.R.C.S.

Surgeon, St. Mary's Hospital

The following personal impressions are the result of a unique opportunity offered to me in October, 1946, of taking over a professorial chair in surgery at Harvard University for a period of three weeks. The chair was that of the late Elliott Cutler and his hospital the Peter Bent Brigham ("P.B.B.").

The Medical Faculty of Harvard in some ways resembles that of the University of London in that teaching is carried out both at the Central Harvard Medical School, where the "first and second year" subjects of anatomy and physiology are taught (i.e., our premedical sciences are not in America included in the medical curriculum), and, for the purely clinical subjects, at a series of hospitals in Boston, of which the Massachusetts General, the City, and the Infants', together with the P.B.B., are the chief. At all these various hospitals professorial chairs have been established, as is the case with the London teaching hospitals, but a very noticeable point of difference is the much closer relation between the staffs of the various hospitals. It is the accepted custom, if not the duty, of the staff of any one of the group to attend various meetings at the others at certain intervals. I therefore, during my stay in Boston, had the invaluable opportunity of meeting the staffs of the other allied hospitals—of seeing their work, both clinical and operative, and of discussing educational problems with them.

At my own wish, while in Boston I lived in the hospital and thus got opportunities of meeting and talking to the resident staff and senior students which I otherwise could not have obtained. The P.B.B. is not a large hospital—some 350 beds only—but its staff, both resident and honorary, is out of all proportion according to our standards.

Staff Work at the "P.B.B."

Despite their numbers the accommodation and facilities provided for the staff would make the mouths of any English counterpart water profusely. With the exception of the professors, they are all part-time, but many of them have consulting-rooms in the hospital buildings and the use of hospital facilities, both clerical and clinical. The majority are subsidized either by the University or by the hospital itself for the non-private work done in the hospital. So far so good, but with the arrangement of staff work one finds it more difficult to be in agreement. This is done by a system of "assignment," which means that each member of the staff is labelled with a specialty and all routine admissions are channelled to an assigned surgeon. Thus although each of these assigned surgeons is in fact a general surgeon he gets no routine admissions except in his specialty apart from (*a*) private patients and (*b*) emergencies, the majority of which latter class are in fact dealt with by the resident surgical officers. These assignments are additional to the accepted specialties such as orthopaedic, thoracic, neurological, and plastic surgery. As examples one may quote "colon and rectum," "oesophagus," "stomach," "thyroid," "septic hands," "hypertension," "pancreas," "peripheral vascular disease," and even "blood transfusion" and "peritoneoscopy."

Superspecialization

This scheme brings up the whole question of superspecialization, a trend which has become steadily and increasingly more obvious in America over the last twenty years. Logically one must admit that if the patient with the right disease gets into the hands of the right superspecialist he can reasonably expect something out of the ordinary in the way of special treatment, with correspondingly better relative results. But even in America this is still a large "if," and the successful achievement of it demands a very high degree of skill in sorting and initial diagnosis. Such skill can surely be acquired only by one whose training and experience have given him sufficient breadth of vision to view the whole surgical field in perspective—i.e., the exact antithesis of the superspecialist, who, while working more and more efficiently at the bottom of his groove, gets so deep into it that he ultimately has difficulty in seeing anything at all over the edges.

In a teaching school, where after all one is chiefly responsible for making doctors and only to a much smaller extent specialists, the tendency seems even more dangerous. Taken to its ultimate conclusion it would call for the training of a special teacher whose only duty would be the integration into a composite whole of the limited spheres of a series of small specialties. There is nothing to prevent a general surgeon having and developing a particular field of interest, but he must remain a practising general surgeon so long as he accepts responsibility for teaching students to be doctors, by which is implied persons capable of dealing with individual people, not individual diseases. Medicine is surely still a profession with a scientific basis. When it becomes a science with a professional basis, then there may be some justification for an assignment system of allocating work. Let us admit we are living in the age of specialization, but let us watch carefully, particularly as

* Extracts from a paper delivered to the Harveian Society (December, 1947) and the Northern Counties Medical Society (January, 1948).

teachers of students, lest what we gain on the swings our patients lose on the roundabouts.

The war, with its large number of young medical men in the various Services, led to an underlining of the values of specialization from both the prestige and the financial angles that was only natural under the circumstances. But it has led in these post-war years, with their large and increasing influx of prospective medical students and ultimately therefore doctors, to a warped perspective on the relative importance of general practice as compared with specialization. And this applies equally to both countries. It is exceptional among recently qualified applicants for resident appointments to find one in twenty who expresses the ultimate intention of being a doctor. And there is one other aspect of this question that merits consideration. As the numbers of medical students (and budding specialists) have rapidly risen the number of teachers has only very slowly followed suit, and thanks to the contingencies of the war years a considerable proportion of the new increment of teachers have had very little experience of teaching at all—far less the teaching of embryonic specialists. The teaching of specialists I consider to be one of the more important duties of the staff of a teaching hospital, but I feel that it is essential at this particular stage that those prospective specialists should be well and carefully chosen, that they should be limited in numbers at any one teaching institution, and that they should be meticulously and specifically trained to maintain a breadth of vision and a wide perspective even inside their chosen specialty. Only so can the profession remain a profession and yet not lag behind in service to its patients. The more far-thinking teachers in America are only too well aware of the problems raised by this tendency to over-specialization—and here, I feel, is at any rate one sphere in which British opinion and example can help.

The Resident Staff

To return to our hospital—a few words about the resident staff. This consists of a resident surgeon, a number of assistant resident surgeons, and the interns (or house-surgeons). Apart from these regular appointments there are in most American hospitals a variable number of so-called "Fellows," the number varying with the endowments of the hospital or university concerned. These Fellows, appointed annually with possible extensions, rank in seniority immediately under the resident surgeon, but do come into the direct line of administrative control. They are of the status of our registrars, and are attached to specific clinics, usually for specific research. In the P.B.B., for instance, there were four Fellows, one in charge of the Laboratory of Clinical Research (of which more anon), one attached to the surgeon-in-chief for clinical research, one (by a special bequest) attached to the Department of Urology, and one a Travelling Fellow. This last appointment surely has much to commend it and is one which we in this country might well emulate to a greater extent than is at present the case. The Travelling Fellow will have done approximately four years' postgraduate work as intern and assistant surgical officer, and he will return from his wanderings—wanderings which, guided by his chief and reasonably financed by his school or university, will last at least a year—qualified either to become a resident surgeon or a junior member of the full staff at his own or another hospital. In this connexion I was particularly impressed during my visit with the responsibility felt and accepted by the senior staff of a hospital in getting their senior residents in a suitable appointment.

The resident surgeon's appointment only rarely finds its counterpart in this country. In America it is often an indefinite appointment as regards length of service, though naturally its holder is a very eligible candidate for a staff appointment at his own or another hospital. He really has junior staff status without actually being on the staff, and he has very considerable responsibilities, both clinical and administrative. In the P.B.B. he was an approved "instructor" of the Harvard Medical School and was responsible for the education not only of the clinical clerks but also of all the resident staff. He also gave surgical lectures to the nursing staff. He had charge of beds and arranged operating lists for the various visiting surgeons and acted as their locum in their absence; he either did or delegated all emergency surgery, and he saw all surgical discharges from the hospital.

The assistant resident surgeons correspond fairly closely to our registrars—but they are resident. Normally there are four, but, as in our hospitals at present, there were three extra ex-Service ones when I was at the P.B.B. The appointment is for 16 months and is divided into four periods of four months—the first spent as senior resident in the out-patient (or "outdoor") department and the private wards, while the holder is also responsible for the medical care of resident staff, nursing staff, and students; the second in a special department, both in-patient and out-patient; the third with the surgeon-in-chief, when he arranges clinical teaching of students; and the fourth in the general wards, when he becomes second-in-command to the resident surgeon, actually does student clinical teaching, and runs the follow-up department. During all these appointments he is responsible for case records, for keeping contact with general practitioners, and for pre- and post-operative orders, and he is the chief assistant at operations.

From this it will be gathered that the role of the intern (house-surgeon) is perhaps relatively less important than with us, but nevertheless his training is carefully graded and his responsibilities steadily expanded. His appointment is for 28 months—the first four at his own hospital, the next twelve at the Infants' Hospital, and the final year again at his own hospital. This training is aimed at teaching a young doctor surgical practice in contradistinction to the assistant surgical officer posts, which are essentially for those who intend to specialize in surgery.

The intern at first is but a glorified clinical clerk. He does the routine laboratory work of his wards and the dressings; he removes plasters and does transfusions, lumbar punctures, catheterizations, and takes instruments at operations. On his return from the Children's Hospital—this appointment being considered of great importance to the potential general practitioner—he returns to more senior status at his own hospital. Part of the final year is spent in the out-patient department, part with various special departments, and part in the wards. During this time he gives anaesthetics (usually under the supervision of a nurse-anaesthetist!), assists at operations, and does minor surgery, cystoscopies, etc. He supervises the clinical clerks' activities and the case records, interviews relatives daily, is responsible for the "dangerously ill" list and for post-mortem examinations, and assists the resident surgeon with emergency work. As will be seen, this provides a very exhaustive training, and it is at the end of this period that the resident goes either to general practice well versed in surgical principles and the technique of minor procedures, or to specialization in surgery well founded on its practical essentials. These are much more ambitious appointments than we make in this country, but for those that obtain them the training is excellent. One has to balance against this the fact that a hospital of similar size in this country would give (admittedly less thorough) resident teaching to probably twice the number of men, and it seems to me that while such a post is ideal for the potential surgeon it is perhaps a little elaborate for the future general practitioner.

Final-year Students

And so to the last group of "residents," the final (fourth)-year students, who act as clinical clerks. I am sure the fact that they are residing is of great importance and offers an

example we should strive to follow whenever circumstances permit. These students are by courtesy called "Doctor" in the wards for the patients' benefit, they are supplied with white coats—the real resident staff being attired by the hospital in full white uniforms—and it is impressed upon them that they act as subsidiary house officers and have a definite responsibility both to the patients and to the hospital. It is also laid down that, like any other member of the house staff, they have no stated hours for work. There are at least two of them on duty every Saturday, Sunday, and public holiday. They have free access to their particular wards at all times. Ordinarily they are assigned one case per day only, by the senior intern or assistant resident surgeon, and this case they "work up"—the result being duly corrected by their resident. They attend all examinations (clinical, radiological, biochemical, etc.) of their own patients *only*, and act as second assistant if these are operated upon. They do *not* attend operating sessions as a routine. Special stress was laid upon the linkage of clinical and laboratory findings (and upon operative and post-mortem results). They were taught to differentiate between "taking" a case and "presenting" a case—and they were specifically forbidden to have any contact with patients' relatives. One of their rules particularly caught my attention: "Clinical clerks should address all members of the staff, whether doctor or nurse, with proper regard for his or her status and duties;" and in my dealings with them I thought this rule was both intelligently and sympathetically interpreted, and raised some slightly uncomfortable feelings in my mind when I thought of our somewhat casual medical student of to-day. No institution can run really efficiently without a certain amount of discipline, but there is no reason why this should in any way mar an otherwise happy atmosphere. It may be old-fashioned, but I find myself rather longingly looking back to the days when a chief was a chief and his residents and dressers treated him with corresponding respect. Probably the fault lies as much with us as with the students, but it was a little startling to have better what I may call "ward manners" brought up to one's consciousness in an American hospital.

Of these young Americans I wrote at the time in my diary: "Keen, very theoretical, and a little stereotyped, politely argumentative but intelligent, receptive, and enthusiastic"—a description which I still think is reasonably fair.

The teaching of the final-year clinical student interested me enormously. There are no set lectures for him as such—and in fact in America there is no doubt the routine clinical lecture has passed out of the sphere of practical politics as a medium for clinical teaching. All his tuition is given either at the bedside or at special lecture-demonstrations. There is a clinical teaching round daily, the weekly programme being:—Monday, fractures and orthopaedics (alternate weeks); Tuesday, general surgery; Wednesday, special surgery (neurological, thoracic, E.N.T., plastic, and dental); Thursday, genito-urinary surgery: Friday, general surgery.

Under this last heading are included all those special assignments mentioned earlier in this paper. In this connexion it is worthy of note that the general surgical wards contain a complete mixture of cases—including gynaecological. This mixing of cases in the surgical wards is quite deliberate in many hospitals—to achieve (*a*) a wide experience for the student, and (*b*) an opportunity for the visiting staff to meet and mix. While nobody could deny these advantages, the drawbacks are equally obvious. Apart from these daily clinical rounds, the student follows the assistant resident surgeon on his daily "disposal round," when he sees and gives instructions to all hospital discharges, and every Sunday morning the resident surgeon gives a brief clinical session.

Surgical Research Laboratory

At this point I should like to mention a facility possessed by every large teaching hospital in America, and woefully conspicuous by its absence in this country—the Surgical Research Laboratory. This has two prime functions—research and teaching. The laboratory is under the charge of a director (responsible to the surgeon-in-chief), who is often a Fellow of the hospital as previously described, and who usually has one or more qualified assistants working with him and an adequate number of skilled technicians. It is thanks to the existence of these laboratories (and the American's rather more rational view on vivisection) that so much more new experimental work appears to, and in fact does, come from American hospitals than from our own. The stimulating effect of such an institution in a teaching hospital is very definite. On the teaching side I found its activities equally advantageous. In a student's second year—i.e., Final Anatomy year—he attends the laboratory twice a week for two hours, and by demonstrations on dogs, by excellent enlarged photographs, by films, and by demonstration of instruments is taught the rudiments of operative surgery and the value of surgical anatomy. One should point out that in this year the student is also studying pathology—in fact, the American medical student's course, he having completed his pre-medical basic sciences before being enrolled as "Medical," consists of two years of anatomy, physiology, and pathology, and two years of clinical work. The first two years are done at the Central Harvard Medical School, the latter two at any one of the associated teaching hospitals. In his final (clinical) year the student again comes to the surgical research laboratory—and this time, for one session of three hours each week, himself performs on anaesthetized dogs simple surgical exposures and operations.

There was yet one more excellent link-up between clinical and preclinical years that I discovered at P.B.B. Once a fortnight the surgeon-in-chief of the hospital gives a lecture-demonstration—followed, if possible, by a demonstration operation—to the second-year anatomy students. Although this was held on a Saturday morning it was attended by more than 150 students, and appeared to be a most popular feature. As an example, the particular Saturday morning for which I was responsible involved a simple discussion of the applied anatomy of the biliary system followed by a demonstration of two cases of jaundice and one of palpable gall-bladder, followed by the easiest cholecystectomy it has ever been my fortune to do. This demonstration operation can be watched, by such students as wish to stay, from a glassed-in gallery through opera-glasses.

From the above description it will be seen that the clinical student's tuition is essentially personal, practical, and at the bedside—all three very important considerations. Any further tuition he derives from purely voluntary attendance at any of various so-called "Staff Conferences" that occur at regular intervals. Many of these are such excellent institutions—well worthy of emulation in our hospitals—that I intend to describe them in detail.

Staff Conferences

First the "Grand Rounds," one surgical and one medical weekly, which are in fact clinical demonstrations of interesting selected cases or groups of cases actually in the hospital. Such cases are carefully worked up by the resident staff, who present them with all available clinical, radiological, and pathological data as succinctly as possible, leaving the

member of the staff responsible for the case to add any remarks he thinks fit or to draw possible deductions. Thus in an hour or so one sees a wealth of varied clinical material, questions are welcomed, mistakes freely admitted, and constructive suggestions for diagnosis or treatment put forward. Such "grand rounds" are attended by all the visiting staff who can make themselves available, by visitors from other hospital staffs, from other centres and from abroad, and by the resident staff and senior students of the hospital concerned. They enable the whole staff to keep in touch with the activities of each individual section of it, and they are held in a delightfully friendly and stimulating atmosphere.

Which last remark can apply with even more force to the universal and popular meetings known as "Clinico-Pathological Conferences." These "C.P.C.s" have a wide appeal not only to the staff of the hospital concerned but also to those of associated hospitals, visitors, resident staff, and students. They were said to have been initiated by Richard Cabot, of the Massachusetts General Hospital, but are now routine weekly institutions in most of the bigger American hospitals—and, one is glad to say, an increasing number of British hospitals. Briefly, a case that has terminated fatally is chosen (usually by the resident surgeon and the pathologist) from the records, in which clinical and post-mortem data are well described. The former are worked up into a clinical story, which is typed out and circulated to all concerned anything up to a week before the actual C.P.C., to allow of time for such study of the case as these notes make possible. An "introducer" is selected, who may be a member of the staff of the hospital concerned, of another associated hospital, or a visitor, and he analyses the case before the assembled multitude, asking such questions from his colleagues as he thinks may help his deductions, and finally giving his provisional diagnosis. On this he himself can be interrogated by any member of the audience, after which the clinical students' and the residents' diagnoses are given. The pathologist then rises, demonstrates the post-mortem specimens, and shows sections of the morbid tissue—thereby, as ever, having the last word and providing the correct answer. These C.P.C.s are carried out in the most friendly spirit, mutual criticism is common, much valuable information is aired, and no greater success can attend the ultimate dénouement than for the "introducer" and most of his staff colleagues to be entirely wrong in their clinical diagnosis—particularly if the students' answer is correct!

Another weekly conference at the P.B.B. was the "*X*-ray Conference," when the radiologist produced a series of films to illustrate some particular morbid condition. These again lead to a free and open clinical discussion which is usually as instructive as it is stimulating. Once a week, too, the surgeon-in-chief and the pathologist combine in a "Surgical-Pathological Conference," in which specimens from current cases are discussed with their relevant clinical background and details of operative procedure and the necessary deductions drawn and morals pointed. Thus residents and students come to know of any interesting case which may have occurred on any firm in the hospital during the week. And twice a month a tea is held in the surgical research laboratory, after which a brief description is given of current research work—the subject then being thrown open to discussion.

Two other weekly staff conferences at the P.B.B. are worthy of note, though their clientele is limited. One is the Medico-Surgical Meeting, at which the staff discuss mutual problems of diagnosis and treatment, and the other the Surgical Staff Seminar, when the surgeon-in-chief meets his resident staff to talk over any problems, clinical or administrative, that may have arisen in the surgical service.

Salient Points of the American Method

Summarized briefly, the chief points that would seem to arise from the above description of clinical teaching in an American hospital are:

Advantages.—(i) A closer liaison between the individual members of the staff of any one hospital and, if possible, between the staffs of groups of hospitals. The prospective regionalization of hospitals may well bring this conception more into the field of practical politics in this country. (ii) The closer link between clinical services on the one hand and pathological, radiological, physiological, and anatomical departments on the other. It is only fair to say that present indications suggest a very definite move in this direction here, but there is yet much scope for development. And much the same may be said of (iii) The preference for clinical demonstrations of various types in lieu of the routine systematic course of lectures. (iv) The institution of properly organized, staffed, and equipped research laboratories for the use both of undergraduates and of post-graduates. (v) The development of postgraduate instruction during the "resident" period involving a reorientation of ideas concerning the house-surgeon and R.S.O. One feels at the moment that here he is primarily and often essentially simply only a servant of the hospital and a useful adjunct to a firm. He is nevertheless, and in a particularly formative period, a potential specialist or at best all-round doctor, and deserves individual attention and tuition.

Disadvantages.—(i) Too much reliance on accessory methods of diagnosis, to the detriment of appreciating the value of simple clinical signs. (ii) As a corollary, the tendency to train the student to treat diseases rather than patients. (iii) The tendency to "spoon-feed" the student and even the immediate post-graduate, so that as a doctor able and willing to accept responsibility he matures relatively late. This lack of practical initiative in the medical student of to-day is by no means peculiar to America, but one feels that there it is the result of a definite system, here perhaps the result of the present and immediate post-war conditions of life.

If I have made it clear by these few words that I do most earnestly believe that there are lessons to be learnt on both sides to the benefit of each, and ultimately the profession as a whole, then I have not entirely failed in my task.

Reverting to more mundane affairs, may I mention one or two points in hospital life over there which particularly struck me. Like all other visitors one cannot help being impressed with the excellence of the clerical and record facilities. Personally, as visiting surgeon-in-chief I acquired the services of two secretaries, whose all-round efficiency was equalled only by their very delightful personalities.

And this was indicative of the service throughout the hospital—a service greatly assisted by the presence of a number of dictaphones in various key situations; for example, in the theatres and out-patient consulting-rooms. I was envious, too, of the surgical artist permanently attached to the hospital staff and of the easy facilities for photographing clinical and pathological material. In this connexion, incidentally, routine frozen sections are made of material removed at operation, and the report on them is delivered to the surgeon in the briefest possible time.

Of other amenities in the P.B.B. let me mention just two more: the "Brigham Shop," where both staff and patients can purchase on the spot the little necessities of life, as well as more expensive articles for the special occasion; and the "Cafeteria," where excellent meals are dispensed with minimum staff all day (and apparently all night), and where staff, residents, and students mix freely and on a delightfully friendly basis.

Surgical Experiences at the P.B.B.

Turning now to the more definitely surgical side of my experiences, perhaps a word or two at first of the operating

room (not theatre) may not be out of place. In American hospitals generally the bulk of the routine operating is done in the morning, and 8 a.m. is not considered an early start. At the P.B.B. only emergencies were done after lunch-time, except in very particular circumstances. All anaesthetics were given by nurses—or by residents and students under tuition from nurses; and let it be said that these nurses were using all modern methods (except spinal), and to my personal knowledge gave excellent service. Nevertheless one cannot help feeling that anaesthesia presents an interestingly obvious hiatus in American specialization. That determined efforts are being made to close this gap became very evident during the war while American forces were in this country, and there is no doubt that much of the stimulus for the movement came from the Americans' very definite appreciation—and even envy—of our anaesthetic service. Even so, anaesthesia and to a lesser extent plastic surgery remain in the States the two orphans of the specialist family.

One had no dearth of assistants while operating—an R.S.O. or an intern (or sometimes both), two students (one for retracting and the other for instruments), and a nurse responsible for swabs, packs, sutures, and drainage material, were always "washed" up. For washing up, liquid soap was supplied on tap, and the subsequent skin detergent was kept in elbow-deep containers. Operating towels in this particular hospital were a delicate shade of duck-egg blue and were used in profusion. In fact, I thought there was a tendency to obscure the actual site of operation with a plethora of towels and packs. A sucker and diathermy are routine preparation for every operation, and I was a little startled on my first night to see both used in the treatment of a simple subcutaneous abscess. One soon gets used to asking for "snaps" instead of artery forceps and "ties" for ligatures. Generally speaking, silk is being far more widely used than catgut as ligature and suture material. In this connexion my use of a continuous skin suture was looked upon as something quite unique. An interesting peculiarity of this hospital was the use of silver foil as an immediate dressing to the wound. All in all, theatre technique showed only differences in detail from methods in use in this country but it was in all respects meticulously accurate. The facilities and the service made actual operating a pleasure, even despite the absence of one's accustomed tools.

In conclusion may I say that this, my latest visit to America, has left me with two predominant feelings—first, very genuine gratitude to my hosts and colleagues in the States for allowing me to do so much, see so much, and hear so much under such delightful and stimulating conditions; and, secondly, the profound belief that all of us who have the good of the profession at heart should encourage in every possible—and preferably practical—way the development of exchange schemes between our two countries. There are many things to be both learnt and unlearnt on either side of the Atlantic.

The governors of the National Corporation for the Care of Old People have appointed a Scottish committee to advise the National Corporation on its activities in Scotland and to make recommendations about grants for old people's homes and other welfare services in Scotland. In addition to the resources made available by the National Corporation it is hoped to attract funds from private gifts or legacies. All such moneys raised in Scotland will be devoted to the welfare of old people in Scotland. The members are Sir Hector Hetherington (chairman), Dr. A. Grieg Anderson, Dr. A. D. Briggs, Dr. R. W. Craig, Miss Grace Drysdale, Prof. Thomas Ferguson, Mr. H. L. F. Frazer. Mr. C. S. Gumley will act as hon. treasurer, and Miss E. V. Lowe has been appointed secretary. The offices will be at 2, St. Andrew Square, Edinburgh, 2. It is hoped to co-opt to the committee in their personal capacities two members from the Department of Health for Scotland and the Scottish Assistance Board.

THE PUBLIC HEALTH LABORATORY SERVICE*

ORIGIN AND DEVELOPMENT OF PUBLIC HEALTH LABORATORIES

BY

G. S. WILSON, M.D., F.R.C.P., D.P.H.

Director of the Public Health Laboratory Service (Medical Research Council)

The early work of the public health bacteriologists was carried out partly in special laboratories, such as that established privately in Howland Street by Burdon-Sanderson in 1870, the Brown Institution in the Wandsworth Road, founded the following year, and the British Institute of Preventive Medicine (now the Lister Institute), established in 1891; partly in university laboratories, such as Edgar Crookshank's laboratory in King's College, London, Percy Frankland's laboratory at Dundee, Delépine's laboratory at Owens College, Manchester, and later in laboratories at Durham, Leeds, Sheffield, Cambridge, and Bristol; partly in municipal and county laboratories, such as those that began to be established around 1900 at Liverpool, Cardiff, Wakefield, Derby, and Worcester; partly in laboratories housed in hospitals, such as Klein's laboratory at St. Bartholomew's; and partly in commercial laboratories that had sprung up for the purpose.

Since comparatively few local authorities considered it economically justifiable to establish laboratories of their own for carrying out public health work, an extensive postal system grew up by which specimens were sent to laboratories situated often at considerable distances from their origin. Birmingham University laboratory, for example, examined specimens from Southampton; the Lister Institute from Burton-on-Trent, Northampton, and Exeter; the Clinical Research Laboratory from the East Riding; and Thresh, Beale, and Suckling's laboratory from as far afield as Scotland. This development during the early part of the present century had a profoundly baneful effect. In the first place it brought to an end the close association that had existed from the start between bacteriology and epidemiology. It was clearly impossible for laboratory and field workers to collaborate under these conditions, with the result that both parties suffered unduly. Secondly, it degraded the status of the pathologist, whose business it became merely to turn out results demanded by the medical officer of health or other similar official, and led to the growth of what may be termed "shop pathology." In consequence technicians began to replace qualified pathologists, the work became stereotyped, the background of the laboratory investigations was neither realized nor studied, and research fell into abeyance. Thirdly, it introduced into medicine a regrettable atmosphere of commercialism. University laboratories encouraged the work of the routine laboratory because of the large sums that it provided, and voluntary hospitals took up public health bacteriology as a side-line in order to bolster up their exiguous finances.

Pre-war Position

Before the second world war the position was broadly as follows. Many universities, such as Manchester, Leeds, Birmingham, Sheffield, Durham, and Bristol, maintained routine laboratories for public health work. A few private pathologists had started dual-purpose laboratories which

*The second Milroy Lecture, delivered to the Royal College of Physicians of London on Feb. 12. Lecture I appeared in last week's issue.

were designed to meet both hospital and public health needs, and which undoubtedly fulfilled a useful function at the time. Some counties and county boroughs, such as the West Riding, Somerset, Staffordshire, East Suffolk, Bradford, Birmingham, Hereford, and Cardiff, had established laboratories themselves where public health work, either alone or combined with a certain amount of clinical pathology, was carried out. The majority, however, of local authorities made no such provision. The larger ones among them sent their work to a university, hospital, private, or commercial laboratory; the smaller had little or no work done at all, owing to the lack of interest of their medical officer of health or to unwillingness to incur the necessary expense.

With few exceptions, practically the whole of this work was of the "postal" and the "shop" type, and was carried out by technicians working under the supervision sometimes of a medical man, who was not always a bacteriologist, and sometimes of a chemist. Little or no field work was undertaken by the laboratory. Small outbreaks of food-poisoning and infectious disease were neglected; larger outbreaks were investigated by the sanitary inspector, sometimes with the help of the medical officer of health; and for serious outbreaks officers of the Ministry of Health were called in, often so late as to enable them to perform no more than what was virtually a post-mortem examination.

One striking exception to this general picture was provided by the Ministry of Health's laboratory at Dudley House. There, in a few rooms of a converted office, depressing in their appearance and poorly equipped, work of an exceptionally high order was carried out by the Ministry's small staff of bacteriologists—Fred Griffith, W. M. Scott, and V. D. Allison. The expert knowledge that these workers had acquired by their pioneer work on haemolytic streptococci, pneumococci, meningococci, and the group of food-poisoning bacilli led to their advice being sought by pathologists from all over the country. Their laboratory became, in fact, a reference laboratory, appealed to by courtesy rather than by right, but nevertheless serving a valuable purpose and constituting the prototype of the numerous reference laboratories now established under the Public Health Laboratory Service. The staff were fundamentally interested in epidemiology and collaborated closely with the Ministry's officers in the field. This laboratory, almost alone in the whole country, maintained through the long years before the second world war the tradition, established by Simon and carried on by his successors at the Local Government Board, of the intimate relation between laboratory and epidemiological investigations.

The Emergency Public Health Laboratory Service

After preliminary discussions initiated in February, 1934, on the need for protecting the country against the possible use of bacteriological warfare, the Committee of Imperial Defence set up a Subcommittee on Bacteriological Warfare in November, 1936. Taking stock of the position, the subcommittee soon reached the conclusion that the country was ill equipped to deal with large-scale epidemics that might follow evacuation of the town populations, or what was then considered to be the less serious danger of bacterial sabotage. They recommended that a civilian bacteriological service should be established to supplement the inadequate existing facilities to combat these two dangers, and suggested that the Medical Research Council would be the most appropriate body to foster it. The Committee of Imperial Defence accordingly invited the Medical Research Council to plan and administer the new service, which was to be renamed the Emergency Public Health Laboratory Service. In accepting this task the Council arranged, for the sake of convenience, to be responsible itself for public health laboratories in the provincial areas of England and Wales, but to hand over control of laboratories in the London area to the Emergency Medical Service, which was operating directly under the Ministry of Health and which was dividing London for administrative purposes into sectors based on teaching hospitals.

Extensive preparations were made by the Council during 1938 and 1939. Because of London's special risk of aerial bombardment, Oxford was chosen as the headquarters. Regional laboratories were planned for Cambridge and Cardiff, and multiple small constituent laboratories for parts of the country where the need for them was greatest. Premises were found in schools, technical colleges, and universities. Part of the equipment was promised by existing institutions; the remainder was bought and stored in suitable places. The staff was recruited from university departments and research institutes.

The service was mobilized at the end of August, 1939, one week before the declaration of war. A skeleton staff was left at the Medical Research Council's offices in London; otherwise workers took up their stations at the laboratories to which they had been assigned. For a short time nothing happened. The expected aerial bombardment did not occur; little or no attempt was made at bacterial sabotage; and the wisdom of establishing the service at all began to be questioned. Laboratories in the more isolated districts remained idle, and were closed down or transferred elsewhere.

Gradually, however, the more co-operative medical officers of health realized the advantage of having a laboratory service at their doorstep, and began to employ it partly for their routine work and partly to help them in the investigation and control of epidemic disease. Both functions developed rapidly. From the start the laboratories endeavoured to provide a consultative service, and doctors were welcomed and encouraged to bring in specimens themselves and discuss difficult problems with the staff. The heavy administrative work imposed by the air-raid precautions service prevented medical officers of health from getting out into the field, and in many districts they were only too ready to delegate the investigation of outbreaks of infectious disease to the laboratories. In this way a regional epidemiological service began to be built up the importance of which was hardly realized at the time.

The wisdom of providing a free service for laboratory and field investigations in relation to epidemic disease soon became apparent, since only in this way was it possible for adequate studies to be made among large communities regardless of the number of specimens that had to be taken. For routine work payment on a block-grant basis was arranged.

Numerous problems in applied bacteriology cropped up that demanded solution, and before long active research was being undertaken in many of the laboratories on a variety of subjects. Special methods were devised for controlling diphtheria outbreaks in schools, a new method of preparing typhoid vaccine was discovered, the treatment of nasal carriers of diphtheria bacilli by sulphonamide snuff was introduced, field trials were carried out for measuring the antigenic potency of alum-precipitated diphtheria toxoid, meningococcal surveys were made among groups of the population in epidemic and non-epidemic areas, salmonella infections were traced to the newly imported spray-dried egg (Report of the M.R.C., 1947), the properties of the enterotoxin responsible for staphylococcal food-poisoning were studied, and a nation-wide survey was organized to ascertain the part played by the bovine type of tubercle

bacillus in the rising incidence of non-pulmonary tuberculosis.

In many parts of the country the service rapidly became an integral part of the public health organization, and early in 1944 the Ministry of Health approached the Treasury for permission to continue it on a peacetime basis and to extend it to the whole of England and Wales. Provision to this effect was made in Section 17 of the National Health Service Bill, which received parliamentary sanction in November, 1946, and the Public Health Laboratory Service in its permanent role came into operation immediately. The Medical Research Council agreed to administer the service for an initial period of five years, and the slow work began of building up a national organization that would provide a free public health laboratory and epidemiological service for the whole country.

[The lecturer then gave a brief description of the Public Health Laboratory Service. A full account will be published elsewhere (Wilson, 1948). He described how it comprises an administrative headquarters at Westminster, a central laboratory at Colindale, regional laboratories at Oxford, Cambridge, Cardiff, and Newcastle, about twenty-five smaller so-called area laboratories in the provinces, a series of reference laboratories for expert examinations, and a few associated laboratories. The service is a national service intended to provide, free of charge, medical officers and practitioners with all the help that modern bacteriological and epidemiological methods of investigation can give them. Technical control is almost entirely decentralized. The series of laboratories form a coherent whole imbued with a double spirit of service to the community which they are designed to help, and of research into the problems of fundamental and applied science the solution of which may be expected to contribute to the furtherance of preventive medicine.]

Administration of the Public Health Laboratory Service by the Medical Research Council

Why, it may be asked, should a service carrying out routine public health laboratory investigations be administered by the Medical Research Council rather than by the Ministry of Health? Without being in a position to state the official views of the Council, my own interpretation of the reasons why it is appropriate for the Council to undertake this task may be summarized as follows.

Historically, the Medical Research Council can look back to the annual grant of £2,000 made to the Privy Council in 1871 for the purpose of carrying out Auxiliary Scientific Investigations. The vote to this effect agreed to by Parliament the previous year was significant not merely in its relation to the immediate uses of the medical department of the Privy Council but as an acknowledgment of the principle that research is desirable in the interests of preventive medicine. Simon, who was responsible for obtaining this grant, used it, as did his successors, for the study of research problems arising out of the more normal investigational work of the department. Ample funds were available for the prosecution of routine field inquiries by officers of the Local Government Board into the prevalence of infectious disease and its contributory causes, but the money allotted to the Privy Council was additional to this and was earmarked for more academic types of research, whether on fundamental or applied problems.

The control by the Privy Council of money granted for research was maintained when the Medical Research Committee, which since its formation in 1913 had been attached to the Insurance Commission, was reconstituted as the Medical Research Council in 1920 and placed under a special committee of the Privy Council. The types of investigation carried on now by the Public Health Laboratory Service are essentially similar to those for which the grant sanctioned by Parliament in 1870 was intended. Much of the research work in progress in its laboratories derives from the routine laboratory and field work, and would in Simon's day have been classified under the heading of Auxiliary Scientific Investigations. In agreeing, therefore, to administer the Public Health Laboratory Service the Medical Research Council is being true to its heritage.

Secondly, though it is correct to say that the Public Health Laboratory Service has routine duties to perform, in much the same way as a university has teaching duties to perform, an equally important interest lies in research work. Most of the senior members of the staff came from university departments and research institutes, and have been engaged in original work for many years. The junior members are chosen for their ability, and are specially trained to fit them for research. Every encouragement to undertake research is given: special equipment is supplied; extra technical assistance is provided when necessary; study facilities are allowed; and complete freedom of choice of subject is permitted.

In the earlier years of this century there was a reaction against clinical medicine, and physiologists, experimental pathologists, and bacteriologists shut themselves up in research laboratories, used small animals for their tools, and made important discoveries, the results of which, however, were often distressingly slow in being applied to practical conditions. The laboratory, in fact, was too far in advance of everyday practice, and a rift of increasing width grew up between the laboratory worker on the one hand and the clinician and medical administrator on the other. In his introduction to the Report of the Medical Research Council for the year 1937–8 Sir Edward Mellanby drew attention to this, and said that the Council could not but view with regret "the delay which so often occurs between medical discovery and its application, especially when the discovery is one that provides an immediate opportunity of preventing or even eliminating disease."

The Council, which had already through its various units begun successfully to apply laboratory methods to clinical medicine, decided therefore to appoint a Preventive Medicine Committee to promote the application of scientific knowledge to field problems, working for this purpose in close collaboration with medical officers of health. Before this committee started to function properly the second world war came and accelerated the reaction against laboratory seclusiveness. With its demand for the urgent solution of human medical problems it brought all sorts of scientific workers together and made them think broadly in terms of epidemiology. One of the great lessons it taught us was that, however valuable knowledge gained from the use of experimental animals may be, the final court of judgment must always be the human subject and the human herd. Before long the Medical Research Council found that the Emergency Public Health Laboratory Service was carrying out on a much more extensive scale the very type of field investigation which the Preventive Medicine Committee had been established to perform. The Council now possesses in the permanent service an excellent instrument for gaining, by controlled inquiries on groups of the child and adult population, knowledge that it believes cannot be obtained in any other way.

A third reason is that the Medical Research Council is a body far more adaptable to change and development around it than is the Ministry of Health. The Ministry's functions are administrative and advisory rather than executive. It would be ill fitted to take responsibility for the organization of a service requiring rapid action based upon highly technical knowledge with often no precedents to guide it. For this purpose a body such as the Medical

Research Council is required whose strength lies on the scientific rather than on the administrative side, and whose long experience of research problems and research workers enables it to appreciate more readily the manifold difficulties that are likely to arise.

I have given three reasons why the Medical Research Council should control the Public Health Laboratory Service. There are others, but I need not dwell on them. Historically, functionally, and spiritually the Medical Research Council is specially fitted for this task, the planning and execution of which have been in the Council's hands from the beginning.

Relation of the Public Health Laboratory Service to the Hospital Pathology Service

Public health bacteriology arose as a direct outcome of the work of the great sanitary reformers—notably Chadwick and Simon—on the control of diseases engendered by filth, poverty, and overcrowding. It provided a useful tool for the discriminating application of the quarantine regulations, and its growth was encouraged, especially in the great port of Liverpool, by the interest of far-seeing commercial magnates in the development of the Tropics (Hope, 1931). A further stimulus was supplied by the challenge of animal diseases that were communicable to man which called for laboratory and field studies to elucidate their mode of origin and transmission. The bacteriology of air, water, sewage, milk, and foods was studied and developed in the interests of the community: and it was partly or mainly in the same interests that the laboratory examinations in respect of diphtheria, enteric fever, smallpox, anthrax, tuberculosis, and several other infectious diseases were undertaken. Laboratory research itself arose primarily from the desire to afford assistance to the central health authority by the provision of more exact scientific knowledge. Thus public health bacteriology and epidemiology were intimately related from the beginning, their chief purpose being to assist in the prevention and control of infectious disease in the community.

On the other hand, so-called clinical pathology arose as a handmaid to the clinician in the hospital for the diagnosis and treatment of the individual patient. The examination of urine is of almost age-long standing, and has blossomed of recent years into the elaborate methods now used by the biochemist for studying the body fluids. Morbid anatomy and histology grew up under the influence of the great German pathologists of the last century, and flourished under the demand for the exact classification of tumours. The haemacytometer was described by Gowers in this country in 1877 and his method of haemoglobin estimation in the following year, and formed the beginning of the laboratory study of the blood diseases which is known as haematology. Bacteriology was gradually introduced for the diagnosis of pneumonia and infections of the genito-urinary tract and for the examination of pus from the suppurating wounds of the surgical wards. Its application to treatment in the form of vaccine therapy received a great stimulus from the work of Almroth Wright and his school which even yet has not quite spent itself. Broadly speaking, however, bacteriology is only one of the tools employed by the clinical pathologist, and constitutes not more than a quarter of the work of a modern hospital laboratory.

Thus in their origin, their development, their application, and their outlook public health bacteriology and clinical pathology may be regarded as separate branches of pathology, the one related to preventive, the other to curative medicine.

The fundamental truth of this thesis has been obscured by the frequent and more or less accidental association of the two main subjects in the same laboratory to which I have already referred. As a result, public health bacteriology came to be linked more and more with hospital pathology; its distinctive purpose and outlook were lost, and it degenerated into a mere appendage of clinical pathology. This association was not without compensating advantages. Hospital pathology and public health bacteriology overlap to some extent, and it is convenient for both to be carried out in the same building. My main contention, however, is that the two subjects are essentially distinct, that they grew up under different historical backgrounds, and that their later association was accidental rather than intentional and fraught on the whole with deleterious consequences to preventive medicine in this country. They should be recognized as separate branches of pathology, under different technical control but closely linked together and performing complementary functions, the one caring for the herd, the other for the individual.

Relation of the Public Health Laboratory Service to the Universities

Many universities in the past have maintained, and still do maintain, laboratories for carrying out routine public health bacteriology. Though they undertook only examinations of the "shop" and "postal" type, they did in their day perform a useful function in providing local authorities that could afford it with much of the technical information they required. It is time, however, for their function in this respect to be reviewed.

Bacteriology has made such rapid strides forward of recent years that the supervision of the numerous different techniques carried out in a modern laboratory requires the whole-time attention of a highly trained director. The primary duty of a university professor is teaching and research, and there is a growing consensus of opinion that no professor should have to be responsible for the administration of routine work. Either he will devote himself to his academic duties and neglect the laboratory, or his attention will become so absorbed by routine work and problems arising out of it that the conduct of his department will suffer.

Again, the increasing specialization that has followed fresh discoveries has led to the growth of experts who are now looked to for help from all parts of the country. No longer is it possible for any single laboratory to give a comprehensive service. Only by organizing a laboratory service on a national basis, with the provision of properly staffed and equipped reference laboratories where any type of work requiring great skill or special reagents can be carried out by the most experienced workers, is it possible to make full use of present knowledge.

Perhaps an even more weighty reason why universities should not be responsible for routine public health laboratories is that they are not in a position to provide a satisfactory epidemiological service for their region. To do so would necessitate a considerable increase in their medically qualified staff, with little prospect of the lucrative returns that are associated with postal pathology.

On the other hand, there are considerable advantages to be derived from the close association of a national public health laboratory with a university department of bacteriology. Medical staff and technicians can be exchanged for training purposes; routine material can be supplied for practical classes; postgraduate students can receive the benefit of lectures and demonstrations from a wider range of experts; research problems thrown up in the routine laboratory may be investigated at leisure in the university department; methods and biological reagents devised in the university department may be tried out in the laboratory or

in the field; and the presence together of two groups of workers with a common interest but with a different outlook tends to produce that indefinable psychological atmosphere in which ideas are born and research flourishes.

Relation of the Public Health Laboratory Service to the Ministry of Health

Prior to 1939 epidemiological data were centralized at the Ministry and a specially qualified staff was maintained to be sent forth as a flying-squad to investigate outbreaks of infectious disease in different parts of the country. This system was not without considerable merit, and it enabled many valuable epidemiological studies to be carried out by officers of the old Local Government Board and of its successor the present Ministry of Health. It suffered, however, from two serious disadvantages, both attributable to over-centralization.

The fact that the epidemiological headquarters of the Ministry were in London naturally made provincial medical officers hesitant to ask for help without due cause A large proportion of outbreaks were never investigated properly at all, and when the Ministry's officers were called in it was often too late to permit of effective control measures being instituted.

The second disadvantage was that under this system the only laboratory on which the Ministry's officers could call for aid was the Ministry's own laboratory in London. Arrangements might be, and sometimes were, made for examination to be carried out locally, but these had to be paid for by the local authority and were therefore usually curtailed to a minimum. The central laboratory rendered invaluable help in certain types of investigation, but it was not in a position to provide that first-hand aid on the spot which is so invaluable in the conduct of an epidemiological inquiry.

The creation of the Emergency Public Health Laboratory Service in 1939 rapidly led, as has already been stated, to the growth of a regional epidemiological service. Each laboratory acted as a centre for local field investigations, and was ready at all times to assist medical officers of health in the area. As a result, probably ten times as many outbreaks of infectious disease were investigated as before the war, and the laboratory was often called in at the beginning instead of towards the end of an outbreak. In addition, the laboratory often gained its information first, and was then able to draw the medical officer of health's attention to the occurrence of cases of disease of which he was still ignorant. Laboratory workers took part in the field inquiry itself, visited the scene of the outbreak, acquainted themselves with the epidemiological background, collected their own specimens, examined them, and were then able, in making their report, to interpret the findings more helpfully than if they had known nothing about the conditions under which the specimens had been taken. Moreover, without encroaching on the province of the medical officer of health, who is statutorily responsible for the control of infectious disease, they could frequently offer valuable advice to him regarding the measures that should be taken to prevent its further spread. When special examinations beyond their competence were required they could call freely upon the various reference laboratories maintained by the national service and receive expert information and advice as good as, or better than, that obtainable anywhere else in the country. Modern developments in serological and phage typing have led to the virtual "fingerprinting" of many organisms, and the epidemiologist who cannot rely on unstinted help from the local general and the central reference laboratory labours under a grave disadvantage.

Manifestly it was impossible for the old centralized and the new regionalized systems of epidemiology to coexist without resulting confusion. The working arrangement now in operation is that where the national service maintains a constituent laboratory epidemiological inquiries are made locally. The principal medical officer of the region, who is in touch with the Ministry of Health, is informed, as are also the headquarters of the Public Health Laboratory Service, which immediately transmits the information to the Ministry. In this way the Ministry knows what is happening in areas of the country where national laboratories are maintained, and its headquarters staff join in local inquiries only when the resources of the Laboratory Service are insufficient to deal with the situation. When, on the other hand, the Ministry receives information before the service it usually passes this on so that investigations can be set on foot at once by the local laboratory.

There are, however, still several areas where the Public Health Laboratory Service has not yet started to function, and in these the old system is continued, though in a modified form. The Ministry's officers take part in investigations in collaboration with the local medical officer of health, but are now able to make full use of the nearest constituent or associated laboratory of the service and of the central reference laboratories.

One province of epidemiology remains solely in the hands of the Ministry, namely, that dealing with the quarantine diseases—smallpox, typhus fever, yellow fever, cholera, and plague. These are of international importance, and the Ministry has to maintain close touch with other countries and with the World Health Organization. The Laboratory Service is of considerable help in the diagnosis of these diseases and is being used for this purpose more and more, but it leaves their epidemiological investigation to the Ministry.

The Future

In his annual report for 1912–13 Sir Arthur Newsholme, who was then chief medical officer of the Local Government Board, reviewed the available facilities for pathological examinations, deplored their inadequacy, and drew up plans for their extension. According to MacNalty (1948b), provision for general pathological services through local authorities was made in the financial estimates of the Government for the year 1913, but the advent of war indefinitely postponed central action. It is interesting to note that Newsholme favoured the formation of dual-purpose laboratories carrying out both clinical pathology and public health bacteriology, and thought that 15 to 20 large laboratories at appropriate centres throughout the country would be better than a large number of smaller laboratories.

When the provision of an organized laboratory service on a national basis came up for reconsideration thirty years later so many changes had occurred since Newsholme's report that it was no longer considered advisable to adopt his recommendations. Both clinical pathology and public health bacteriology had developed greatly, making it undesirable for any one laboratory director to be technically responsible for both branches. The distinction between the essential interests of the clinical pathologist and the public health bacteriologist had become clearer, and the experience during the early years of the war had shown the importance of locating the clinical pathologist in the hospital while encouraging the public health bacteriologist to engage in field inquiries. Moreover, it was being increasingly realized that for the proper investigation and control of epidemic disease a public health laboratory service should cover the entire country.

In view of these considerations it was felt by the Ministry of Health that in the new National Health Service it would be sound policy to organize clinical pathology on a regional basis in conformity with the regional distribution of hospitals, but to provide a national service to take charge of public health laboratory and epidemiological investigations. This course has been adopted, and when the National Health Service Act comes fully into operation at the beginning of July clinical pathology will be under the general control of the Regional Hospital Boards, whereas the Public Health Laboratory Service will continue to be a national service administered by the Medical Research Council.

Is this the final solution, or is it merely a temporary device to avoid the difficulty of imposing a national pathological service on regionally controlled hospitals? Time alone will provide the answer to this question. My own view is that the present solution is worth trying. The regional pathological system may suffer from a lack of some of the advantages enjoyed by a national service, such as mobility and ready interchange of staff, provision of reference laboratories, ease of organizing group research investigations, and central purchase of supplies. Provided, however, the pathological heads of the regions meet together from time to time and arrange for central co-ordination of the different hospital laboratories, some of the difficulties that might otherwise crop up may be avoided. This could probably best be done by the appointment of a technical adviser, with his headquarters in Whitehall, who could settle differences between the regions and keep in close touch with the Public Health Laboratory Service to ensure harmonious relations at all levels.

Public health and hospital laboratories should work in close co-operation. Wherever possible they should be placed side by side, so as to constitute a pathological centre to which doctors of all sorts may repair for consultation and to which specimens may be brought regardless of the particular laboratory in which they will be examined. Ultimately, perhaps, it may be advisable to establish a national service for hospital pathology corresponding to that now in being for public health bacteriology and epidemiology, but the time is not yet. For some years to come the regionalization of hospital functions will be on trial. During that period I believe that it should be possible to provide a complete pathological service irrespective of the fact that, because epidemiology is a national problem and treatment a local one, the administration will be central for the one service and regional for the other.

I should like to express my thanks to Sir Arthur MacNalty, Dr. Mervyn Gordon, Prof. R. M. F. Picken, Dr. E. W. Hope, Lieutenant-Colonel E. F. W. Mackenzie, and Dr. E. H. Walker for providing me with valuable information, and to Sir Edward Mellanby, Sir Wilson Jameson, and Dr. Landsborough Thomson for their critical help with certain portions of the manuscript.

REFERENCES

Allison, V. D., and Brown, W. A. (1937). *J. Hyg., Camb.*, **37**, 153.
Arkwright, J. A. (1920). *J. Path. Bact.*, **23**, 358.
Bang, B. (1885). *Dtsch. Z. Thiermed.*, **11**. Reprinted in B. Bang's *Selected Works*, 1936. Humphrey Milford, London.
Baxter (1875). *Rep. med. Offr Privy Council and loc. Govt Bd*, New Series, No. VI, p. 216.
Bendixen, H. C., and Minett, F. C. (1938). *J. Hyg., Camb.*, **38**, 374.
Brown (1890). Quoted from *The Examination of Water and Water Supplies*, by Thresh, Beale, and Suckling, 5th ed., p. 4. Churchill, London.
Buchanan, G. (1881–2). *11th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. xxi.
Budd, W. (1856). *Lancet*, **2**, 617, 694.
—— (1873). *Typhoid Fever: its Nature, Mode of Spreading, and Prevention*. Longmans, Green, London.
Bulstrode, H. T. (1894–5). *24th ann. Rep. loc. Govt Bd, med. Offr's Suppl. (Spec. Suppl. App. No. 1.)*
—— (1909–10). *39th ann. Rep. loc. Govt Bd, med. Offr's Suppl. (Spec. Suppl.)*
Burdon-Sanderson, J. (1866). *3rd Rep Commiss. Cattle Plague*, Appendix A, p. 1. H.M.S.O., London.
Burdon-Sanderson, Lady (1911). *Sir John Burdon-Sanderson: A Memoir*. Clarendon Press, Oxford.
Cobbett, L. (1901). *J. Hyg., Camb.*, **1**, 228, 235.
Cory (1881–2). *11th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 127.
Dack, G. M., Cary, W. E., Woolpert, O., and Wiggers, H. (1930). *J. prev. Med., Baltimore*, **4**, 167.
Delépine, A. S. (1902). *British Medical Journal*, **2**, 934.
—— (1908–9). *38th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 341.
Dodgson, R. W. (1936). *British Medical Journal*, **2**, 169.
—— (1938). *Proc. R. Soc. Med.*, **31**, 925.
Felix, A., and Pitt, R. M. (1934). *J. Path. Bact.*, **38**, 409.
Frankland, P. F. (1886). *Proc. roy. Soc.*, **40**, 509.
Gordon, M. H. (1898–9). *28th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 480.
—— (1900–1). *30th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 353.
—— (1902–3). *32nd ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 421.
Gowers, W. R. (1877). *Lancet*, **2**, 797.
Graham-Smith, G. S. (1903). *J. Hyg., Camb.*, **3**, 498.
Grünbaum, A. S. (1896). *Lancet*, **2**, 806, 1747.
Hesse, W. (1884). *Mittheil. kaiserl. Gesundhts.*, **2**, 182.
Hope, E. W. (1931). *Health at the Gateway*. Camb. Univ. Press.
Houston, A. C. (1901–2). *31st ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 494.
Kay, H. D., and Graham, W. R. (1935). *J. Dairy Res.*, **6**, 191.
King, G. J. G. (1944). *Mon. Bull. Min. Hlth. Lond.*, **3**, 84.
Klein, E. (1886–7). *16th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 367.
—— (1894–5). *24th ann. Rep. loc. Govt Bd, med. Offr's Suppl. (Spec. Suppl. App. No. 2)*, p. 109.
—— (1899–1900). *29th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 574.
—— (1900–1). *30th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 564.
—— and Houston, A. C. (1897–8). *27th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 318.
—— —— (1898–9). *28th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 498.
Kobro, I. (1923). *Ann. med. History*, **5**, 393.
Koch, R., Gaffky, G., and Loeffler, F. (1881). *Mitth. Reichsgesundh Amt.*, **1**, 322.
Lister, J. (1867). *Lancet*, **1**, 326, 357, 387, 507.
MacNalty, A. S. (1947). *J. roy. Inst. publ. Hlth*, **10**, 96, 128.
—— (1948a). Ibid., **11**, 9.
—— (1948b). Ibid., **11**, in press.
Newsholme, A. (1912–13). *42nd ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 214.
—— (1935). *Fifty Years in Public Health*. Allen and Unwin, London.
—— (1936). *The last Thirty Years in Public Health*. Allen and Unwin, London.
Pakes, W. (1900). *Lancet*, **1**, 311.
Park, W. H. (1901). *J. Hyg., Camb.*, **1**, 391.
Parkes, E. A. (1873). *A Manual of Practical Hygiene*, 4th ed., p. 473. Churchill, London.
Power, W. H. (1879–80). *9th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 47.
—— (1880–1). *10th ann. Rep. loc. Govt Bd, med. Offr's Suppl. (Spec. Suppl. App. No. 2)*, p. 302.
—— (1882–3). *12th ann. Rep. loc. Govt Bd, med Offr's Suppl.*, p. 63.
—— (1884–5). *14th ann. Rep. loc. Govt Bd, med. Offr's Suppl.*, p. 55.
—— (1885–6a). *15th ann. Rep. loc. Govt Bd, med Offr's Suppl.*, p. 73.
—— (1885–6b). Ibid., p. 111.
Report (1947). *Spec. Rep. Ser. med. Res. Coun., Lond.*, No. 260.
Ritchie, J. (1901). *J. Hyg., Camb.*, **1**, 125.
Simon, J. (1890). *English Sanitary Institutions*. Cassell, London.
Smith, T., and Reagh, A. L. (1903). *J. med. Res.*, **10**, 89.
Thudichum, J. L. W. (1864). *7th Rep. med. Offr Privy Coun.*, p. 303.
Wells, W. F. (1934). *Amer. J. Hyg.*, **20**, 611.
Widal, F. (1896). *Bull. Mém. Soc. Hôp. Paris*, **6**, 26.
Wilson, G. S. (1948). "The Public Health Laboratory Service" in *Modern Trends in Public Health*. Butterworth, London. (To be published.)
Wilson, W. J., and Blair, E. M. McV. (1927). *J. Hyg., Camb.*, **26**, 374.
Woodhead, G. S. (1897). *J. State Med.*, **5**, 289, 357, 405, 453.

Nurses who hold the Royal Medico-Psychological Association's Certificate are now able to apply for admission to the Register of the General Nursing Council for Scotland without further training or examination, as the result of an agreement between the Council and the Scottish Branch of the Royal Medico-Psychological Association. Under this agreement the Royal Medico-Psychological Association ceases to admit new candidates for its Certificate, the last Final Examination for which will be held in November, 1951. After that date State-registration will be the only qualification obtainable by students in mental nursing. Applications for registration by holders of the R.M.P.A. Certificate should be addressed to the Registrar of the General Nursing Council for Scotland, 5, Darnaway Street, Edinburgh, 3.

THE GUTERMAN TEST IN THREATENED ABORTION

A REPORT BASED ON 100 CONSECUTIVE CASES

BY

S. BENDER, M.D., M.R.C.O.G.

Ethel Boyce Fellow in Gynaecology, Liverpool University

In a recent paper (Bender, 1947) experimental work was reviewed which suggested that the administration of progesterone in the treatment of threatened abortion is indicated where there is a natural deficiency of the hormone, but that its use in the absence of progesterone deficiency is not only pointless but possibly increases the chances of the abortion progressing. This is because one of the actions of the hormone is to increase the amplitude of uterine contractions (Schultze, 1931 ; Moir, 1936 ; Henry and Browne, 1943). Accordingly, before starting specific therapy in these cases it is desirable to divide them into two categories—those accompanied by progesterone deficiency and those not so accompanied. This differentiation can be made by estimating the level of urinary pregnanediol excretion, which level is held to provide a reliable index of progesterone metabolism. The Guterman (pregnanediol excretion) test, although less exact than lengthier methods of pregnanediol assay, has been found eminently suitable for this purpose. The test has many practical advantages —it is economical and can be completed within three hours, it does not involve the use of experimental animals, and a 24-hour specimen of urine is not required, 100 ml. of a first morning specimen being sufficient. The details of the procedure, together with those of a quantitative method of assay applied to the test, are given in the paper referred to above (Bender, 1947).

Guterman (1944, 1945) originally employed the test for pregnancy diagnosis, a purpose for which, in my hands, it has not proved accurate enough to replace established biological tests. Later, Guterman (1946) reported on the use of the test in estimating the prognosis in cases of threatened abortion. Where the test was positive—i.e., the 100 ml. of urine contained more than 0.4 mg. of pregnanediol—the pregnancy continued in 30 of 34 cases, and where it was negative abortion ensued in 38 of 39 cases. The present investigation was undertaken in order to ascertain the value of the test for what seemed clinically a more fruitful purpose—namely, the determining of whether progesterone should or should not be administered in any given case of threatened abortion.

The present paper is based on a review of 100 consecutive cases diagnosed clinically as threatened abortion, including 55 already reported (Bender, 1947), in which the Guterman test was performed. In 79 cases an Aschheim–Zondek test was carried out on the same urine specimen. The follow-up in each case extended primarily for a limited period of five weeks, because the test result was significant of the urinary pregnanediol level at the time of test only. The clinical diagnosis of threatened abortion was not confirmed in all cases ; in 94 the patient was or had recently been pregnant, while in 6 the condition from which the patient suffered was subsequently shown to be unassociated with pregnancy.

In 7 cases, all true threatened abortion, the test result was vitiated because progesterone had been administered within the 72 hours immediately before the collection of the urine for the test. In these a false positive result could therefore not be excluded. The remaining 93 cases fall naturally into five groups according to the final diagnoses and the test results.

Group 1 (68 Cases).—These were proved by positive Aschheim–Zondek tests and by the subsequent history and findings to have had a live pregnancy with abortion threatening at the time of the test. They can be regarded as cases of true threatened abortion. This group is subdivided into (*a*) those cases with a positive Guterman test (42 cases) and (*b*) those with a negative or weakly positive Guterman test (26 cases).

Group 2 (19 Cases).—In these cases the Guterman test was negative and the Aschheim–Zondek test was either negative or weakly positive. The clinical course in these cases confirmed that the process of abortion was already irreversible at the time of test, complete abortion having occurred in 8 cases and threatened expulsion of an already dead pregnancy being the condition in the other 11.

Group 3 (3 Cases).—The Guterman test in these cases was positive but the Aschheim–Zondek test was repeatedly negative. In each case there was present a unilateral cystic ovarian swelling which gradually regressed over a period of months, the Guterman test eventually becoming negative. These were cases of corpus luteum cysts ; in one there was a history of such a cyst having been removed at laparotomy a year previously.

Group 4 (3 Cases).—In these cases both tests were negative and the conditions present were found to be unassociated with pregnancy.

The distribution of these 93 cases, together with the comparable figures of Guterman (1946) and McCormack (1946), was as follows:

Group		Bender	Guterman	McCormack
1a	Threatened abortion; positive test	42	34	0
1b	Threatened abortion; negative test	26	32	30
2	Complete or missed abortion; negative test	19	7*	0
3	Not pregnant; positive test ..	3	0	0
4	Not pregnant; negative test ..	3	0	0
		93	73	30

* These cases were included by Guterman among his total of threatened abortions with negative tests. Study of his tables shows that in all seven the simultaneously performed Friedman test was also negative. They cannot therefore be regarded as true threatened abortions, the foetus being already dead.

Results and Comment

True Threatened Abortion (Group 1a).—The method of treatment and the outcome in the 42 cases showing no evidence of progesterone deficiency as reflected in the urinary pregnanediol level were: of 11 treated with progesterone 7 aborted and 4 did not abort ; of 31 not treated with progesterone 6 aborted and 25 did not abort.

True Threatened Abortion (Group 1b).—The figures in the 26 cases with evidence of progesterone deficiency showed that of 14 treated with progesterone 2 aborted and 12 did not abort ; and of 12 not treated with progesterone 9 aborted and 3 did not abort.

In a series of 30 cases parallel with Group 1b McCormack's (1946) figures were: of 10 treated with progesterone 2 aborted and 8 did not abort ; of 20 not treated with progesterone all aborted.

The natural corollaries of these findings are: (1) There is no indication for treating cases without progesterone deficiency (Group 1a) with the hormone ; on the contrary, its administration in these cases is often followed by abortion, whereas when it is withheld spontaneous recovery occurs in the majority of cases. (2) Where there is progesterone deficiency the prompt administration of the hormone seems to avert the abortion in a large proportion of cases. When it does not it may be that the condition is already irreversible or that there are additional factors present favouring abortion. If, however, progesterone is not given to progesterone-deficient cases abortion nearly always ensues, although there is a possibility of spontaneous cure (Jones and Weil, 1938 ; Hain, 1942).

It may be noteworthy that 3 of the 42 cases with positive tests and 2 of the 26 cases with negative tests were

of women who had previously had three or more abortions. The figures are very small, but they may support the view that progesterone failure is not a major cause of habitual abortion.

Missed or Complete Abortion (Group 2).—The correct diagnosis in these 19 cases was established by the clinical course and by the results of simultaneously performed Aschheim–Zondek tests. This group shows the value of the simultaneous performance of pregnanediol and gonadotrophin pregnancy tests; in missed and complete abortion both are negative, while in true threatened abortion the gonadotrophin test is positive but the pregnanediol test may be positive or negative. These cases also serve as a reminder that it may be difficult, especially in early pregnancy, to differentiate between a threatened abortion and an abortion which has become complete before the patient is first seen. Finally, it becomes apparent that what is termed clinically threatened abortion includes not only true cases of that condition but also cases of threatened expulsion of a foetus already dead.

Corpus Luteum Cyst (Group 3).—In these 3 cases the positive tests reflected the increased production of progesterone by corpus luteum cysts. The correct diagnosis was established by clinical examination and by the combination of positive Guterman test with negative Aschheim–Zondek test; this affords another example of the value of performing both types of test simultaneously.

Not Pregnant (Group 4).—This group comprised 3 cases in which, as in the previous group, a period of amenorrhoea was followed by bleeding. They were cases of pelvic tuberculosis, fibroids at the menopause, and psychogenic amenorrhoea.

Discussion

The value of the Guterman test in determining the line of treatment of threatened abortion can be expressed in another way. If the above findings in respect of cases of true threatened abortion are statistically significant, as they are, then the following conclusions appear permissible.

1. In true threatened abortion 38% of cases are associated with progesterone deficiency and 62% are not. These figures correspond closely with those given by Hain (1942), who employed the lengthier but more accurate gravimetric method of assay of Venning (1937).

2. If progesterone is administered to cases in which there is no evidence of progesterone deficiency 64% abort. If, however, such cases are not treated with progesterone the abortion rate is only 20%.

3. When progesterone is given to patients in whom a low pregnanediol excretion indicates a natural deficiency of progesterone only 14% abort. If, on the other hand, progesterone is withheld in such cases the abortion rate is 75%.

4. If without any attempt at subdivision 100 consecutive cases of threatened abortion are all treated with progesterone, 45 will abort, while if none are given progesterone 41 will abort. Many clinicians are dissatisfied with the use of the hormone in cases of threatened abortion and have noted little, if any, improvement in their results since progesterone therapy was introduced. The above figures substantiate this clinical impression, and indicate that when all cases of threatened abortion are given progesterone the overall results are not likely to be any better than those obtained when no patient is so treated.

5. If, however, all cases of threatened abortion are subdivided according to their progesterone need, and progesterone is given only when the pregnanediol excretion is low, only 18% abort and a considerable salvage of foetal lives is thus made possible.

The belief that progesterone is indicated in cases of threatened abortion because it acts as a "uterine sedative" was originally based on the work of Knaus (1929). More recent work, already quoted, indicates that the hormone causes an increase in the amplitude and not an abolition of uterine contractions. This would explain the adverse results which may follow the administration of progesterone in some cases, and during the present investigation it was in fact not infrequently observed that such administration rapidly accelerated the progress of the abortion. Where, on the other hand, the hormone has apparently relieved the threat of abortion, its action may be due to its ability to maintain the decidua and improve the foetal–maternal vascular connexions (Pincus and Werthessen, 1936).

The necessity for careful clinical examination in all cases is underlined by the fact that if there is no progesterone deficiency another cause favouring abortion must be sought; while if there is such a deficiency it may not be the only abortion-provoking factor present and abortion may then ensue despite progesterone therapy.

Summary

Investigations of 100 cases diagnosed clinically as threatened abortion were made by means of the Guterman test. In 75 the clinical diagnosis was correct. In the remainder a comparison of the results of simultaneously performed Guterman and Aschheim–Zondek tests made or confirmed the correct diagnosis. The Guterman test, although not as exact as lengthier methods of urinary pregnanediol assay, is accurate enough to differentiate those cases of true threatened abortion which are associated with evidence of progesterone failure from those which are not. In the former type of case good results can be expected from progesterone therapy, while in the latter type such treatment may accelerate the course of the abortion.

The results of this investigation suggest that the abortion rate in cases of threatened abortion where the foetus is still alive can be reduced by about 25% by selecting for progesterone therapy only those cases in which the Guterman test is negative or weakly positive.

I am indebted to Prof. T. N. A. Jeffcoate, in whose department this work was carried out, for unfailing encouragement and constructive criticism. I also have to thank Mr. R. L. Plackett, of the Mathematics Department, Liverpool University, for the statistical note.

STATISTICAL NOTE

The 68 cases of threatened abortion were divided into two groups: Group 1a, 42 cases without progesterone deficiency, and Group 1b, 26 cases with progesterone deficiency. The difference between 42 and 34 (68÷2) is significant.

These groups were subdivided, some being treated with progesterone and the remainder not:—*Group 1a:* 11 cases treated with progesterone—7 aborted and 4 did not abort; 31 cases not treated with progesterone—6 aborted and 25 did not abort. *Group 1b:* 14 cases treated with progesterone—2 aborted and 12 did not abort; 12 cases not treated with progesterone—9 aborted and 3 did not abort.

Using Fisher's exact test for 2×2 tables on these results, we have Group 1a, $P=0.0107$; Group 1b, $P=0.00271$. These findings are statistically significant and support the conclusions that: (1) progesterone therapy prevents a probable abortion in cases with deficiency of the hormone; (2) progesterone therapy increases the chance of abortion in cases with no deficiency of the hormone; and (3) if progesterone therapy is given to all cases of threatened abortion the benefit in Group 1b tends to be cancelled out by the loss in Group 1a.

REFERENCES

Bender, S. (1947). *J. Obstet. Gynaec. Brit. Emp.*, **54**, 783.
Guterman, H. S. (1944). *J. clin. Endocrinol.*, **4**, 262.
—— (1945). Ibid., **5**, 407.
—— (1946). *J. Amer. med. Ass.*, **131**, 378.
Hain, A. M. (1942). *J. Endocrinol.*, **3**, 10.
Henry, J. S., and Browne, J. S. L. (1943). *Amer. J. Obstet. Gynec.*, **45**, 927.
Jones, H. W., and Weil, P. G. (1938). *J. Amer. med. Ass.*, **111**, 519.
Knaus, H. (1929). *Zbl. Gynäk.*, **53**, 2196.
McCormack, G. (1946). *Amer. J. Obstet. Gynec.*, **51**, 722.
Moir, C. (1936). *Proc. roy. Soc. Med.*, **29**, 950.
Pincus, G., and Werthessen, N. T. (1936). *Anat. Rec.*, **67** (Suppl.), 34.
Schultze, G. K. F. (1931). *Zbl. Gynäk.*, **55**, 3042.
Venning, E. H. (1937). *J. Biol. Chem.*, **119**, 473.

THE GUTERMAN TEST FOR PREGNANCY

BY

W. H. H. MERIVALE, M.B., B.S., M.R.C.P.

Pathologist, Newcastle General Hospital, Newcastle-upon-Tyne

Guterman (1944) described a comparatively simple test for pregnancy which depends on the colour developed when pregnanediol extracted from the urine of pregnant women is treated with sulphuric acid. Because of its rapidity and the fact that it does not involve the use of animals it appears to have certain advantages over the more commonly used biological procedures for pregnancy diagnosis. It was therefore decided to give it a trial, the results of which are recorded below. The technique of the test is described in full by Guterman in his paper of 1944, to which he has added certain essential modifications in a later publication (Guterman, 1945).

Briefly, conjugated pregnanediol in the urine is hydrolysed by acid in the presence of toluene to give an extract of free pregnanediol, as described by Astwood and Seegar Jones (1941). When free pregnanediol is treated with concentrated sulphuric acid an orange-yellow colour is produced (Talbot, Berman, MacLachlan, and Wolfe, 1941), and the appearance of this colour indicates a positive result. Actually, colours ranging from the palest straw to brownish orange may be obtained, and while the former is to be regarded as negative, the pale yellow colour given by a weakly positive urine requires considerable experience of reading the test to differentiate.

Results of Investigation

In all, 107 tests were made of 105 patients in whom a diagnosis of pregnancy was entertained on clinical grounds; of these, 79 subsequently turned out to be pregnant. Table I shows that in the positive diagnosis of pregnancy the Guterman test was only 57% accurate.

TABLE I

Clinical Category	Number of Patients	Guterman Test Results	
		Positive No.	Negative No.
Pregnant	79	45 (57%)	34 (43%)
Non-pregnant	26	4 (15%)	22 (85%)

The earliest at which a correct positive test was obtained was 8 days from the end of the last menstrual period, and in this case it is known that the test was done on the 15th day after a known single coitus. The latest correct positive result was obtained on the 270th day of pregnancy. The accompanying Chart shows the proportion of correct positive tests to the total number of women tested at each month of pregnancy; it suggests that the test was never more than 65% accurate in the first four months of pregnancy, when it is most likely to be of use, and it was not until the fifth month that any degree of accuracy in diagnosis was obtained.

Of the tests giving an incorrect result 34 were negative, their distribution being shown in the Chart. Four tests gave false positive results, and brief clinical particulars of these are given in Table II.

Another group of women have been tested to determine the usefulness of Guterman's reaction in predicting the outcome in cases of threatened abortion. In this group 47 tests were carried out on 33 patients. In 20 cases the tests were positive or became so on repetition, and 17 of these patients continued their pregnancies, one of them being treated throughout with "proluton C." The 3 patients who aborted in spite of persistently positive tests did so at 4, 5, and 28 days after the last positive result; the last-mentioned patient had been treated throughout with progesterone, and, although she aborted 28 days after the last test, the size of the foetus suggested that intrauterine death had occurred at about the time of that test.

TABLE II.—*Four False Positive Results*

Case No.	History
31	Period within 25 days before the test was carried out. Complained only of enlargement of the breasts, which has since subsided. Definitely not pregnant.
45	Admitted with irregular too frequent menstruation and salpingitis. Also mentally deranged. Last menstrual period within 25 days before the test. Not pregnant.
84	Found to have a blood-stained pleural effusion six months after childbirth: ? chorion epithelioma. Urine sent for Aschheim-Zondek test, but Guterman test done as well. Aschheim-Zondek negative, Guterman positive. Not chorion epithelioma; not pregnant.
74	Single woman, about a week overdue with period. Period began two days after test reported positive. Definitely not pregnant.

Negative tests, or those which became negative on repetition, were given in 11 women, and subsequently they aborted at periods ranging from 1 to 70 days after the last negative result.

Two women gave negative tests after the onset of the symptoms of abortion, but pregnancy continues to the time of writing; one of these patients had a positive result 42 days after her last menstrual period, but when she was tested again 14 days later the result was negative in spite of the fact that she was being treated with progesterone.

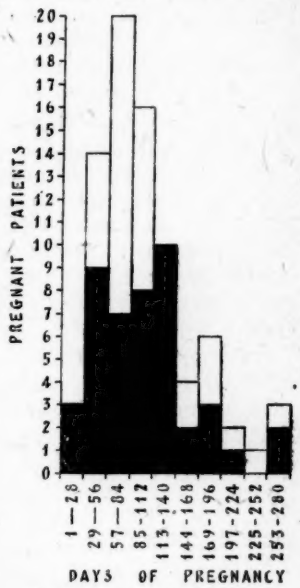

Chart showing results with the Guterman test. The black and white areas represent patients giving positive results and negative results respectively.

Discussion

Browne, Henry, and Venning (1939) and Bachman, Leekley, and Hirschmann (1940) have shown that from 5 to 10 mg. of pregnanediol is excreted daily during the last half of the normal menstrual cycle. As a rule this output ceases one to four days before the onset of the flow (Venning and Browne, 1937). If conception occurs the menstrual daily rate of excretion is maintained or slightly increased (Jayle and Libert, 1946) for the first 70 to 100 days of pregnancy, after which the amount excreted begins to increase rapidly, reaching a maximum of from 60 to 105 mg. daily at about the 266th day. From then until parturition the quantity of pregnanediol excreted falls, though Dahle (1946) throws doubt on this, and no pregnanediol can be recovered from the urine after the first 48 hours of the puerperium.

Our experience with the Guterman test as a method of diagnosis of early pregnancy is at variance with that of other workers. Guterman (1945) in an account of 248 cases, of which 133 were described in his first paper (Guterman, 1944), claims that it is accurate in 92% of cases if sufficient care is taken over the technique. Morrow and

Benua (1946), using Guterman's technique slightly modified and reading the results against an artificial standard in the photo-electric colorimeter, find that the test gives a large number of false positive results in the latter half of the menstrual cycle in non-pregnant women. They confirm the statements of Venning (1937), Hain and Robertson (1939), and Tien (1941) that the colour values for the pregnanediol excreted in early pregnancy may overlap those found in the latter half of the menstrual cycle. They point out that the test is usually positive in early pregnancy but may be negative in pregnancies which progress quite normally. MacCormack (1946), using a slightly modified technique but reading her results with the naked eye, finds an absolute correlation between the Guterman and Friedman tests.

The results presented in this paper do not support the view that the test is reliable enough for adoption as a routine clinical laboratory technique. When it is considered that the total daily output of pregnanediol in the urine in the first three months of pregnancy is only from 10 to 25 mg., and that only 100 ml. of urine is used in the test, it is clear that the amount of pregnanediol present in any given specimen must be very small, and it follows that the colour developed will be correspondingly weak and difficult to differentiate from the straw colour which Guterman regards as negative. In a recent preliminary communication Somerville *et al.* (1947) describe their modification of the methods of Astwood and Jones (1941) and Talbot, Berman, MacLachlan, and Wolfe (1941), which essentially seems to consist in controlling the cooling of the precipitation mixtures to give more regular and exact quantitative recoveries of pregnanediol. They have found that rapid cooling of precipitation mixtures results in low and irregular recoveries; and since rapid cooling is a feature of Guterman's qualitative technique it seems not unlikely that the variability of the results obtained may be at least in part ascribed to that. It is interesting to note that Somerville and his co-workers use for their method one-fifth of a 24-hour sample of urine, which is likely to be more than the 100 ml. prescribed by Guterman.

In view of the very small differences between the amount of pregnanediol excreted in the latter half of the menstrual cycle and that excreted in the first two or three months of pregnancy careful consideration should be given to the question whether any test based on the pregnanediol excretion is likely to be of much value in the accurate diagnosis of early pregnancy.

Guterman (1945) stresses the importance of using freshly prepared alkali dissolved in methyl alcohol for the precipitation of impurities, in order to prevent the occurrence of false negative results. This reagent is freshly prepared every three days in this laboratory.

Cope (1940) has pointed out that toxaemia of pregnancy and chronic nephritis can interfere with the excretion of pregnanediol, but there is no evidence that any of the patients giving false negative results in this series were not completely healthy, with the exception of two. Cases 46 and 49 were both suffering from hyperemesis gravidarum at the time of testing. Case 46 gave a positive result 69 days after the last menstrual period. Case 49 was negative when tested 66 days after the last menstrual period, at which time the Aschheim-Zondek test was also negative; and she was again negative by Guterman's test seven days later. Both these women have proceeded to term.

When the test has been used to predict the fate of threatened abortion our results appear at first sight to agree well with those of Guterman (1946), who was able to predict accurately the outcome in 68 out of 73 cases of threatened abortion; he states that the continuing excretion of pregnanediol in threatened abortion indicates that the pregnancy will be retained, but that if excretion falls or ceases altogether abortion will become inevitable. In this series loss of the pregnancy was foretold successfully in 11 out of 13 patients who gave negative tests, but it is felt that this may well be due to chance in view of our experiences with the test in the diagnosis of pregnancy.

Our finding of three patients who aborted in spite of persistently positive tests is supported by MacCormack (1946): two out of her 30 patients with threatened abortion were positive by both Friedman's and Guterman's tests up to 24 hours before they aborted. She found the Guterman test negative in 30 of her patients, of whom 22 proceeded to abort. Cope (1940), using Venning's (1937, 1938) method for the gravimetric assay of pregnanediol, reports three cases of inevitable abortion in which the urinary pregnanediol excretion was high; and Browne, Henry, and Venning (1939) record a similar case.

In general it seems that if positive results, or tests which become positive when repeated, are obtained from patients with threatened abortion the likelihood is that they will retain the pregnancy, though it is not by any means certain. It is such a common event in normal pregnancy for the test to be or to become negative that little weight can be attached to it as a finding where the continued life of the ovum is in the balance.

Summary

A report is given on the Guterman test for pregnancy.

Tests were made of 105 patients; 67 gave correct diagnoses, 34 gave false negative results, and 4 gave false positive results.

Investigations of 33 patients with threatened abortion showed that the test foretold the outcome within rather wide limits.

The literature is discussed briefly, and the question is raised whether any test based on pregnanediol excretion has any useful part to play in the diagnosis of early pregnancy.

I wish to thank Mr. Linton Snaith, surgeon in charge of the department of obstetrics and gynaecology, Newcastle General Hospital, and members of his staff, for making their clinical records freely available and for providing me with material. I should like to acknowledge the co-operation of Drs. F. C. Butterfield, J. Fraser, H. B. Porteous, and G. Slater, of Newcastle-upon-Tyne, in providing me with material. Finally I have to thank Mr. A. Hall and Mr. J. Jamieson for their expert technical assistance.

REFERENCES

Astwood, E. B., and Seegar Jones, G. E. (1941). *J. biol. Chem.*, **137**, 397.
Bachman, C., Leekley, D., and Hirschmann, H. (1940). *J. clin. Invest.*, **19**, 801.
Browne, J. S. L., Henry, J. S., and Venning, E. H. (1939). *Amer. J. Obstet. Gynec.*, **38**, 927.
Cope, C. L. (1940). *British Medical Journal*, **2**, 545.
Dahle, T. (1946). *Acta obstet. gynec. scand.*, **26**, 627.
Guterman, H. S. (1944). *J. clin. Endocrinol.*, **4**, 262.
—— (1945). Ibid., **5**, 407.
—— (1946). *J. Amer. med. Ass.*, **131**, 378.
Hain, A. M., and Robertson, E. M. (1939). *Lancet*, **1**, 1324.
Jayle, M. F., and Libert, O. (1946). *Bull. Soc. Chim. biol.*, **28**, 372.
MacCormack, G. (1946). *Amer. J. Obstet. Gynec.*, **51**, 722.
Morrow, A. G., and Benua, R. S. (1946). Ibid., **51**, 685.
Somerville, I. F., Gough, N., and Marrian, G. F. (1947). *Lancet*, **2**, 701.
Talbot, N. B., Berman, R. A., Maclachlan, E. A., Wolfe, J. K. (1941). *J. clin. Endocrinol.*, **1**, 668.
Tien, D. S. P. (1941). *Chin. med. J.*, **59**, 416.
Venning, E. H. (1937). *J. biol. Chem.*, **119**, 473.
—— (1938). Ibid., **126**, 595.
—— and Browne, J. S. L. (1937). *Endocrinology*, **21**, 711.

The Annual Report of the Pasteur Institute of Southern India, Coonoor, includes some information on antirabic treatment. At the Institute itself 370 patients received a complete and 59 an incomplete course. The mortality rate among these patients was 0.5%. There were 11 deaths among the 12,922 patients who received complete or incomplete courses at the various subsidiary centres, giving a mortality rate of 0.08%. The total number of patients treated at the subsidiary centres over the 25-year period 1922–46 was 208,481 with 716 deaths, corresponding to a mortality rate of 0.34%. Of the 11 deaths in this group in the year 1946–7 10 followed dog bites and one followed a jackal bite.

HYDROLYSIS OF PROTEIN IN CARTILAGE AND BONE

BY

P. PINCUS, D.D.Sc.Melb., Ph.D.Lond.
(From the Medical School, Westminster Hospital)

The purpose of the work described below was to test the effect on cartilage and on bone of bacteria associated with dental caries.

Dental caries may be defined as loss of tooth structure apart from fracture or abrasion. Harrow (1946) describes dentine as 23% organic matter, mainly collagen, and 77% inorganic matter. Dental caries, then, constitutes loss of both organic and inorganic matter. On the aetiology of caries two schools of thought exist: (1) the inorganic matter, mainly calcium salt (Harrow, 1946), is first removed by acid formed by bacterial breakdown of ingested carbohydrate material, and proteolysis follows; (2) proteolysis constitutes the initial attack and the calcium salts are lost later.

The fact that in carious teeth the protein collagen is hydrolysed suggested that strains of bacteria capable of hydrolysing collagen should be found in such teeth.

Effect of Caries Bacteria on Cartilage and Proteins

Carious material was obtained from a human tooth, immediately after extraction, by scraping the carious lesion with a sterile, slowly revolving, large-size rose-head dental bur (No. 10), allowing the scrapings to drop into 2 ml. of ordinary nutrient broth. For each experiment carious material was prepared in this way. A sterile container was taken to the dental surgery, the extracted tooth placed in it direct from the mouth, and the carious material prepared at once. The period between dental extraction and the inoculation of media with carious material was generally less than 30 minutes; inoculation was done with a sterile glass tube 7 mm. in diameter and about 5 cm. long, with a rubber teat to allow the scrapings to be sucked up and then used as inoculum.

As a source of collagen, cartilage was used. It was obtained from the abattoirs, cleaned, cut into pieces 1 cm. at their largest, and covered with 0.9% NaCl solution in test-tubes. The cartilage was then sterilized without delay, by autoclaving, by steaming, or by heating to 57° C. for one hour on each of eight successive days. In other experiments cartilage was cleaned, cut up, and as before placed in test-tubes covered with saline (0.9% NaCl), no attempt being made to attain or preserve sterility. Serum was often seen to exude from the cartilage.

Carious material was inoculated into broth, on to nutrient-agar and blood-agar plates, on more than 150 consecutive occasions. On incubation at 37° C. bacterial growth was observed in all but about half a dozen; failure to obtain growth on these occasions may have been due to bactericidal substances associated with the practice of dental surgery, such as phenol or creosote. The presence of living bacteria in carious material was thus confirmed.

Cartilage in test-tubes, either sterilized as described or freshly obtained but unsterilized, was inoculated with carious material and incubated at 37° C. Whether the cartilage was sterilized or not, it appeared from Gram-stained smears and aerobic cultures made at frequent intervals, sometimes each day, that the same types of bacteria were present in the cartilage–saline preparations on incubation. At first mixed bacteria grew, but in from two to four days Gram-positive cocci predominated. Following this, Gram-negative bacilli grew and outnumbered all other forms seen; at times they were the only organisms found in Gram-stained smears.

After about seven to ten days' incubation cartilage was seen to be lysed, the separate white pieces darkening to a yellowish powdery mass. The familiar odour resembled that noticed when proteolytic organisms grow in cooked-meat media and, without actual test in the present work, ascribed to such products of protein degradation as indole and skatole.

Fig. 1 shows this change, with the light wooden sticks, identical in weight and length and carrying paper markers, gradually slipping down the tubes as the cartilage loses its springiness. Twenty-three experiments of the kind described have been carried out on cartilage; in all but one the result was as recorded.

It has been said above that Gram-positive cocci and Gram-negative bacilli were seen in cartilage–saline preparations inoculated with carious material and incubated at 37° C. Both these organisms have been grown in pure culture, readily on some occasions; the use of penicillin media has assisted isolation. At times difficulty has been met with in obtaining free growth of the Gram-negative bacillus. Cultural characteristics of the organism are set out below. Isolation of the Gram-negative bacillus was carried out on 17 occasions, pure cultures being obtained. Sterile cartilage–saline preparations were then made, inoculated with the Gram-negative bacillus, and incubated at 37° C. Gross lysis of cartilage occurred, showing that this organism was capable of proteolysis.

Media containing other proteins were then exposed to cultures of the Gram-negative bacillus at 37° C. and observations of free amino-groups made by the use of Sorenson's formol titration method; broth, cooked meat,

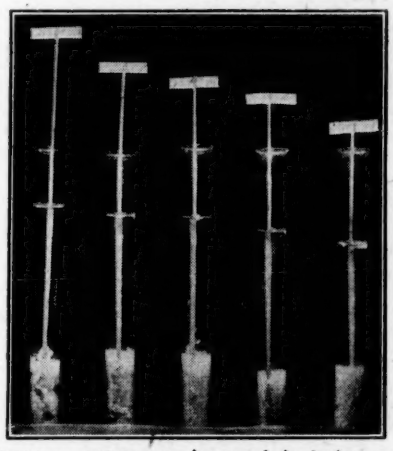

FIG. 1.—Cartilage undergoing bacterial hydrolysis, at the same time losing its characteristic springiness and allowing the light wooden sticks to slip down; on the extreme right the stick rests on the bottom of the tube.

serum, and sericin (from silk) were tested in this way. Copious growth was most readily obtained with sericin media.

Following a personal communication from Dr. M Stephenson, basal medium No. 7 (Stephenson, 1939) was prepared. It contains KH_2PO_4 1 g., $MgSO_4$ 0.7 g., NaCl 1 g., $FeSO_4$ 0.03 g., water 1,000 ml. Sericin from silk was used as the source of nitrogen. The method adopted was to place 1 g. of cleaned raw silk in a phial, cover with 15 ml. of Stephenson's medium, autoclave 30 minutes at 15 lb. pressure (121° C.), and adjust to *p*H 7 with sterile N/100 NaOH. The sterile supernatant liquid gave positive biuret, Millon, and xanthoproteic reactions. On inoculating sericin media with the Gram-negative bacillus and

incubating at 37° C., a maximum titration with formol was reached in seven to ten days; later a fall in free amino-groups was noted. Results of two such experiments were as follows.

Table showing titration of free amino-groups against N/10 NaOH; *Gram-negative bacillus growing in sericin + Stephenson's basal salt media at 37° C.*

Days	ml. of N/10 NaOH	
0	0·05	0·05
2	0·06	0·06
8	0·14	0·31
16	0·25	0·51
28	0·11	0·45

Demonstration of the presence of protein-lysing bacteria in carious material rests on these points: the naked-eye appearance of cartilage undergoing lysis (Fig. 1); its microscopical appearance; the typical odour assumed to be due to the presence of indole and skatole, possibly associated with the breakdown of serum present in cartilage; and the quantitative estimations of free amino-groups (see Table).

Effect of Caries Bacteria on Bone

A femur freshly removed from a cow aged about 5 years was stripped of skin and muscle and sawn into blocks about 1 by 0.5 by 0.5 cm. These blocks, two or three to a tube or screw-top phial, were covered with a mixture of one part broth to 20 parts saline, some sterilized by heating to 57° C. for one hour on each of eight successive days, others autoclaved. These bone preparations were inoculated with the Gram-negative bacillus isolated from carious teeth, and incubated at 37° C. for several weeks, some being opened and examined from time to time. A good growth was difficult to get; the addition of serum was of doubtful value. Possibly the best method was the use of a heavy inoculum.

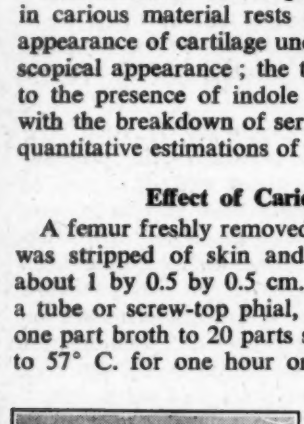

FIG. 2.—Slice of femur from 5-year-old cow. Markings show type of block sawn out.

Fig. 2 shows a slice of mature cow femur; a piece typical of those used for experiments is outlined. Fig. 3 shows mature bone after lysis, the periosteum being indicated. An enlarged view of mature bone after lysis is shown in Fig. 4.

Observations were made on lysed mature bone at two stages: when lysis was half complete and when the bone was reduced to a fragmentary condition. During a routine examination it was noticed that some bone was soft and sponge-like after about 15 days' exposure to the lysing preparation. The soft condition enabled microtome preparations to be made without the usual preliminary acid decalcification. In places structure typical of mature bone may still be recognized. Bone undergoing lysis is not readily examined unless the phial or tube is emptied, because of the considerable deposit that forms in the lower part of the container. This yellow or yellowish-brown material is in a very finely divided state, and if shaken up may take hours to settle. Eventually bone–saline preparations were prepared and sterilized as set out above, inoculated with the culture of the Gram-negative bacillus, and allowed to remain for several weeks at 37° C.

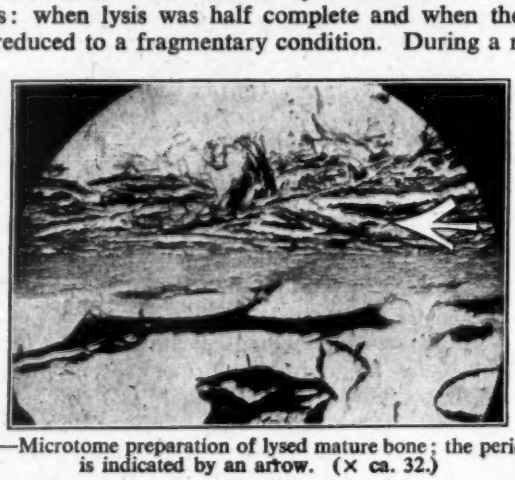

FIG. 3.—Microtome preparation of lysed mature bone; the periosteum is indicated by an arrow. (× ca. 32.)

FIG. 4.—Enlarged view of lysed mature bone. (× ca. 100.)

Frequently, sometimes each day, colorimetric estimations of the *p*H value have been made. Variations between 6.5 and 7.5 have been found, with end-results of prolonged incubation near 8 or even 8.5. Lysis of bone occurred more readily in screw-top phials than in test-tubes plugged with cotton-wool. The nutrient broth did not reduce Fehling's solution and gave a negative Molisch reaction.

Cultural Characteristics of the Two Organisms

Coccus.—Gram-positive; pairs or very short chains; able to grow in the presence of bile; final *p*H in glucose broth 4.5; resists heating to 60° C. for 30 minutes; growth is easily emulsified; mannite, lactose, raffinose, saccharose, all give acid and gas; gelatin not liquefied; litmus milk clotted, turned acid, and was decolorized; readily isolated by routine methods. The organism closely resembles an enterococcus.

Bacillus.—Gram-negative, some motility but not a "spreader"; haemolysis variable from none to clearing about 3 mm. wide; litmus milk, either no acid or doubtful; urea attack doubtful; glucose acid but no gas; salicin, mannite, lactose, maltose, saccharose, dulcite, all negative for acid and for gas (all 48 hours' incubation); gelatin liquefaction either absent or slight unless prolonged incubation is given; after isolation the organisms died out on several occasions. The organism resembles a strain of *Proteus morgani*.

Discussion

The experiments described above show that the organic framework of bone can be destroyed by the proteolytic enzymes of bacteria. It is therefore considered that the main purpose of the experiments has been met. The concept underlying the present experiments is that of hydrolysis of the organic framework of bone. Knowledge of the process of either physiological or pathological resorption of bone appears far from complete. In this respect Brash (1934) states that "the fundamental problem is . . . the control of resorption and not of accretion of bone." Lovatt

Evans (1939), quoting Brash, adds: "This general conclusion, however qualified, is inescapable. It raises resorption to a position of great importance and significance." In 1943 McLean stated: "It thus appears that the decalcification of bone by resorption, involving simultaneous dissolution of both its organic and its inorganic constituents, must be substituted for that of decalcification."

The present work was limited to the isolation in pure culture of one particular organism constantly found in carious material and capable of attack on collagen in cartilage and in bone. Lysis of bone seemed to occur more readily in screw-top phials than in test-tubes plugged with cotton-wool. Lowering of O_2 tension and accumulation of CO_2 occur in cultures in sealed containers.

In 1896 Mall tested the effect of enzymes and of heat (72° and 100° C.) on proteins, finding that exposure to heat followed by exposure to a proteolytic enzyme (e.g., trypsin) produced a greater degree of hydrolysis than either heat alone or the enzyme alone. In the present work there seemed little difference when cartilage was exposed to either 57° C. or 100° C., or autoclaved at about 121° C., though quantitative estimations of hydrolysis were not carried out on cartilage, gross observation appearing adequate. Maximow and Bloom (1942) consider the organic framework of bone to be apparently identical with the collagen of ordinary connective tissue. It is called bone collagen, or ossein. Gelatin is formed from collagen by moist heat. Before they were exposed to proteolytic bacteria, moist heat was applied to both cartilage and bone to sterilize them. The results seen, then, followed exposure to two sets of hydrolytic agents—heat and bacteria. Since Bhagvat and Sreeramamurthy (1944) showed that gelatin (with acid added) was hydrolysed at 120° C. in 45 minutes, it will be clear that sterilization may have caused some degree of hydrolysis.

Some of the above points have been paralleled by other workers. Kowaleski (1940) found collagen to be attacked by mixed cultures from leather works and that Gram-negative bacilli were partly responsible for this attack. Gram-negative bacilli have been shown in the present work to be capable of proteolytic action. The fact that gelatin–peptone bouillon may slowly darken to brown on incubation with bacteria at 37° C. was noted by Drummond (1914). I observed similar appearances with cartilage lysis. Kowaleski (1940) found no bacterial hydrolysis of collagen at *p*H 5 or 6.5, but maximum action at 7.5. I found the *p*H value of cultures in which lysis of bone has occurred to vary between 6.5 and 7.5.

These various points bear on relevant aspects of the work, and it will in fact appear that the underlying concept—i.e., that Gram-negative bacilli might attack both the collagen of cartilage and that of bone—existed in full before the present work was started, though it provides evidence bearing out these findings and joining them in one conclusion.

Summary

Tests of the effect on cartilage and bone of bacteria associated with dental caries are described.

Cartilage and bone sterilized by heat are shown to be broken down when incubated at 37° C. in the presence of bacteria taken from carious teeth.

Pure cultures of a bacillus repeatedly isolated from carious teeth are shown to be capable of attacking some proteins.

Following bacterial hydrolysis at 37° C., quantitative estimations of free amino-groups have been made by the use of Sorenson's formol titration method. Bacterial hydrolysis of bone collagen is shown to have occurred in media with *p*H values close to 7.

Two stages of attack on bone are presented, one more advanced than the other.

Acknowledgments

The encouragement and continued interest of Prof. Margaret Murray, Bedford College, University of London, are gratefully recognized. The possibility of extending work on tooth structure to bone was first brought to notice by Profs. Raper and F. C. Wilkinson, both of the University of Manchester. Laboratory facilities and clinical material have been made available by the University of Manchester and by the Westminster Hospital School of Medicine, the latter through the kindness of Mr. R. S. Taylor. Dr. Fairbrother suggested the use of media containing penicillin. Specimens of bone and cartilage were obtained through the courtesy of the Corporation of Manchester. Miss Dempsey kindly provided microtome preparations and photomicrographs by the courtesy of the British Leather Merchants' Research Association. The Medical Research Council has generously provided financial assistance. For all these facilities I wish to record my sincere thanks.

The research, which is primarily on dental caries, is now, through the kindness of Prof. Samson Wright, being carried on in the Department of Physiology, Middlesex Hospital Medical School.

References

Bhagvat, K., and Sreeramamurthy, V. V. (1944). *Indian J. med. Res.*, **32**, 145.

Brash, J. C. (1934). *Edinb. med. J.*, **41**, 305.

Drummond, J. M. (1914). *Biochem. J.*, **8**, 38.

Evans, C. Lovatt (1939). *Recent Advances in Physiology*, 6th ed., p. 12. Churchill, London.

Harrow, B. (1946). *Text book of Biochemistry*. Saunders, Philadelphia.

Kowaleski, J. F. (1940). *J. Amer. Leather Chem. Ass.*, **35**, 656.

McLean, F. C. (1943). *Ann. Rev. Physiol.*, **5**, 79.

Mall, F. P. (1896). *Johns Hopk. Hosp. Rep.*, **1**, 171.

Maximow, A. A., and Bloom, W. (1942). *Text Book of Histology*. Saunders, Philadelphia.

Stephenson, M. (1939). *Bacterial Metabolism*. Longmans, Green, London.

THE YEARLY RE-EXAMINATION OF A FACTORY GROUP BY MASS MINIATURE RADIOGRAPHY

BY

W. POINTON DICK, M.R.C.S., L.R.C.P.

Physician in Charge, M.C.C. Mass Radiography Unit

The importance of the periodic re-examination of factory and similar groups by mass miniature radiography after an initial survey is generally recognized, and only the shortage of sets and personnel has prevented its routine application. There has not, however, been the same agreement upon the interval which should elapse between surveys. For instance, a three-monthly check has been advocated in some quarters as necessary if the early case of tuberculosis is not to be missed, while Reid (1940, 1941), in America, has formed the conclusion, after considerable experience of the radiological re-examination of personnel of the Metropolitan Life Insurance Company, New York, that a yearly interval is adequate.

The present paper gives the results of the yearly re-examination for four years of personnel of Factory A of the Medical Research Council's Report on Mass Miniature Radiography of Civilians (1945). The findings of the initial re-examination have been published previously as a supplement to the above report.

The surveys under review differ from those reported by Reid in two important particulars—namely, no pre-employment radiography was undertaken, and the annual fluorographic examinations were entirely voluntary and in no way part of a yearly medical check-up. Nevertheless, as is shown below, there has been a marked diminution in the number of significant lesions found in the factory.

It will be realized that the personnel of a factory is constantly changing, and that at each re-examination there is a proportion of persons who have not previously been employed. The following two factors relating to Factory A will help to give an indication of the changing structure of the group. First, the labour turnover in the factory averaged about 24% annually; and, secondly, during the period of the survey the number of employees contracted by approximately 20% each year until the final twelve months, when it expanded by about 10%.

For the purposes of the survey the examinees were placed in one of the following three categories: (1) those who were employed at the factory during the survey of the previous year and who were fluorographed at that time, hereafter designated "EX"; (2) those employed but not examined during the previous survey, "EO"; and (3) those newly employed, "OO." The number of persons in each of these groups together with the volunteer response is given in Table I.

TABLE I

Year	No. of Volunteers	Response	EX Group	EO Group	OO Group
1944 ..	3,539	83%	2,912 (82%)	148 (4%)	479 (14%)
1945 ..	2,649	81%	2,218 (84%)	214 (8%)	217 (8%)
1946 ..	1,987	74%	1,300 (65%)	107 (5%)	580 (29%)
1947 ..	1,843	61%	1,254 (68%)	282 (15%)	307 (17%)

It will be seen that there has been a steady fall in the volunteer response. That this is not due to any waning of enthusiasm as the result of previous visits is suggested by the fact that a similar drop in response, when compared with the war years, is a common finding in surveys to-day. Fear of loss of employment following the discovery of disease (a much more definite possibility now), or the rather general ennui which has been prevalent, may account for the fall. Adequate education of the public in the importance of repeated fluorographic examination is the true answer to this problem of response.

As it was not the policy of the factory management to dismiss from their employ workers who were found to have a significant lesion, it was to be expected that there would be a considerable increase in the number of persons with known lesions who presented themselves for examination. That this was so is shown in the last column of Table II. In this group were cases being kept under observation whilst remaining at work and those who had returned to work after successful treatment at hospital or sanatorium. Ten cases in this group showed evidence of hitherto unsuspected relapse.

An analysis of the findings in the factory as a whole and irrespective of whether or not the individual examinee had been fluorographed a year previously is shown in Table II.

TABLE II.—*Analysis of Total Fluorographed*

Year	No. Examined	Observation Cases	Treatment Cases	Total (O. + T.)	Known Cases
1943 .. (M.R.C.)*	4,720	51 (1·1%)	15 (0·3%)	66 (1·4%)	24 (0·4%)
1944 ..	3,539	23 (0·6%)	7 (0·2%)	30 (0·8%)	37 (1·0%)
1945 ..	2,649	6 (0·2%)	2 (0·1%)	8 (0·3%)	34 (1·3%)
1946 ..	1,987	8 (0·4%)	2 (0·1%)	10 (0·5%)	26 (1·3%)
1947 ..	1,843	8 (0·4%)	2 (0·1%)	10 (0·5%)	22 (1·2%)

* A larger survey by the Middlesex Unit in 1944 of some 34,000 factory employees produced a very similar proportion of cases—i.e., observation 1%, treatment 0·3%, and known 0·4% (Dick, 1945).

The figures for the original M.R.C. survey in 1943 are included for comparison. It will be seen that at the initial re-examination of the factory after one year the percentage of newly discovered significant lesions fell to approximately one-half of the M.R.C. findings. All three subsequent surveys showed a further fall, giving a percentage of cases equivalent to about one-third of the 1943 figures.

A comparison of the findings in Groups OO and EX is shown in Table III. The proportion of significant lesions among the new employees is similar to that found in the general population. The fall noted in Table II is seen to have its origin in Group EX. That the rate of declension is very similar in Tables II and III is due to the relatively small number of new employees examined each year. The proportion of observation to treatment cases in the EX group is higher than in the OO group or in the original M.R.C. survey, in spite of the fact that one would expect a tendency to place in the treatment class cases having had a negative film at the previous survey. This can be accounted for by the minimal extent of the lesions found.

TABLE III.—*Analysis of EX and OO Groups*

Group	Year	No. Examined	Observation Cases	Treatment Cases	Total (O. + T.)
OO ..	1944–7	1,583	14 (0·9%)	5 (0·3%)	19 (1·2%)
EX ..	1944	2,912	18 (0·6%)	4 (0·1%)	22 (0·8%)
EX ..	1945	2,218	4 (0·2%)	2 (0·1%)	6 (0·3%)
EX ..	1946	1,300	4 (0·3%)	1 (0·1%)	5 (0·4%)
EX ..	1947	1,254	4 (0·3%)	0	4 (0·3%)

Of the 37 cases with significant lesions in Group EX 36 were minimal in extent using the diagnostic standards of the National Tuberculosis Association of America (1940). The remaining case was that of a woman aged 29 who was found to have far-advanced disease with excavation and who subsequently died. She gave a history of having had a productive cough, with pains in the chest, and severe headaches for three months. She was losing weight. She well illustrated the fulminating type of phthisis with little or no resistance. Since the introduction of mass radiography it is often possible to show that this type of case has had a negative film only a few months before being diagnosed, thus confirming the rapid onset of this malignant form of the disease.

A follow-up after one year of the 26 observation cases found in Group EX in 1944–6 showed that 5 (1 man and 4 women) had relapsed. All were under 30 years of age. In addition 5 (2 men and 3 women) of the 7 original treatment cases in this group were under 30.

During 1944–7 there were examined 751 persons who, though employed at the factory at the time of the immediately previous survey, had not then been *x*-rayed. Only two cases with significant lesions were found, both in 1947. One, a man aged 30, was kept under observation while remaining at work; the other, a girl aged 18, required sanatorium treatment.

In addition to those cases of pulmonary tuberculosis found by mass radiography there were others diagnosed between surveys, in persons with a previously negative fluorograph, as the result of the development of symptoms. The type of disease, the duration of symptoms, and the time interval between fluorography and diagnosis are shown in Table IV.

TABLE IV.—*Analysis of Cases found Between Surveys Following a Negative Fluorograph*

Year	Sex	Age	Type of Disease	Interval between Fluorography and Diagnosis	Duration of Symptoms before Diagnosis
1943–4	F	20	Post-primary, minimal	8 months	1 month
„	F	21	Plural effusion	9 „	1 „
„	F	21	Post-primary, far advanced	11 „	4 months
1946–7	M	33	Post-primary, moderately advanced	17 „	4 „

Comments

It would appear from these results that a year is a suitable interval between surveys, thus supporting Reid's findings in America. However, the public must be educated in the advantage to be obtained from a periodic *x*-ray examination of the chest, as only by an adequate response can the scheme become fully effective. The fact must be stressed that a negative fluorograph is no guarantee that an abnormality will not develop at some future date.

The considerable fall in the number of cases of pulmonary tuberculosis found seems to be due to at least two factors; (1) the discovery of the early observation lesion with the chances of its subsequent control; and (2) the diminution of the infector pool. The early removal of the infective case must greatly lessen the incidence of disease among its contacts of all ages is generally admitted, and has been demonstrated in contact work at the Ealing Chest Clinic (Dick and Thompson, 1946). This preventive aspect of mass radiography is probably not fully appreciated.

Also, by finding cases *before* they have become sources of infection to their fellows and not, as is more usual if diagnosis has to wait on symptoms, after they have broadcast bacilli for many months or even years, the infector pool is prevented from being restocked. In this light the importance of mass radiography as a preventive measure is truly seen.

References

Dick, W. Pointon (1945). *British Medical Journal*, **2**, 568.
— and Thompson, B. C. (1946). *Lancet*, **2**, 791.
Medical Research Council (1945). *Spec. Rep. Ser.*, No. 251.
National Tuberculosis Association of America (1940). *Diagnostic Standards*.
Reid, Ada C. (1940). *J. industr. Hyg.*, **22**, 303, 408.
— (1941). Ibid., **23**, 35.

Medical Memoranda

Transmission of Syphilis

In a previous communication it was shown that the transmission of syphilis was possible during the incubation stage in the male (Ross, 1939). It was suggested that the semen was infectious and that seminal transmission of the disease had occurred in the case quoted. A case has recently occurred in which the male was suffering from sero-negative primary syphilis and according to some standards was adequately treated. It is again suggested that the method of transmission was by the seminal fluid.

Case Record

On April 1, 1947, a married woman aged 31 reported at a clinic complaining of discomfort in the genital area. She stated that her husband was home on leave in July, 1946, and led a normal married life. In November he was demobilized, but did not resume marital relations. She was of the opinion that her husband realized that she was fatigued by the attention she had to give to a child of the marriage 18 months old who was in indifferent health. However, during the New Year celebrations, while he was partially intoxicated, intercourse occurred on two occasions, and thereafter was discontinued. At the end of January she experienced some discomfort in the genitals, but as this passed off in a few days she did not seek advice. Towards the end of March the discomfort returned and she reported at the clinic. No extramarital intercourse was admitted.

On examination numerous small superficial circular ulcers were found on the labia minora and perineum. Inguinal lymphadenopathy was marked but no other signs were present. Dark-ground examination showed *Treponema pallidum* in serum from the ulcerated areas and the blood Wassermann reaction was strongly positive. A diagnosis of early syphilis was therefore proved, but it was difficult to decide whether it was a case of early secondary syphilis or of sero-positive primary syphilis with multiple lesions. The date of infection must have been about Jan. 2.

The husband was found to be attending a male clinic, and his history was of illicit intercourse in August, 1946, followed three weeks later by a primary lesion of the penis. *T. pallidum* was found in the lesion, but the blood Wassermann reaction and Kahn tests were negative. He was treated in a military hospital for ten days and received 30,000 units of penicillin in aqueous solution every three hours to a total of 2.4 mega units. Thereafter weekly injections of neoarsphenamine and bismuth were continued till Oct. 31, when the total dosage was 2.85 g. of neoarsphenamine and 1.2 g. of bismuth.

He came under the care of the civilian clinic on Dec. 18 and presented no signs of syphilis. The blood Wassermann and Kahn tests were negative. On that day and on Jan. 2 and 8, 1947, he was given 0.6 g. of neoarsphenamine and 0.12 g. of bismuth. He defaulted from treatment, and except for one visit on Feb. 21 was not seen till April 8, when he was clinically and serologically negative.

Thus it would appear that the male patient, infected in August, whose treatment was begun during the sero-negative primary stage in September and continued until Oct. 31 and whose blood Wassermann and Kahn reactions were negative on Dec. 18, was still capable of transmitting the disease during sexual intercourse on Jan. 1 or 2. Further, in spite of the lack of treatment between Jan. 8 and April 8, he was clinically and serologically negative on the latter date.

Therefore the question arises, When is a male who has suffered from syphilis non-infectious? From occasional cases seen in the past twenty years one is confirmed in the belief that the time factor is of more value than the serological test for syphilis. In support of this belief another conjugal case is quoted.

In March, 1936, a woman aged 32, married some eight months, reported with periostitis of both tibiae of the type associated with early syphilis. She gave no history of extramarital intercourse. Her blood Wassermann was strongly positive, and it was thought advisable to ask for the attendance of the husband. He proved to be a defaulter from treatment, but all tests of blood and cerebrospinal fluid were normal.

He was first treated in London in February, 1932, for secondary syphilis. In July of that year his blood Wassermann was negative and a second course of treatment was begun, but he defaulted and received only 2.25 g. of neoarsphenamine and 1.2 g. of bismuth. In August, 1934, he returned with acute gonorrhoea, and, since there were no signs of syphilis and his blood Wassermann was negative, no treatment for syphilis was given.

If the facts and implication of this case are accepted then a three-years history of negativity is not sufficient to exclude the possibility of the infectivity of the semen in a syphilitic. On the other hand, it is a matter of everyday experience that a male whose infection is of more than five years' duration, whether his serological tests are negative or positive, is extremely unlikely to infect his wife.

The advice, therefore, that should be given to an adequately treated male is that he should not attempt to procreate children until five years after the date of his infection.

Since this paper was written Leeming (1947), quoting a personal communication from D. A. Erskine, gives reasons for the belief that men treated for gonorrhoea by adequate doses of penicillin may, in a prolonged sero-negative syphilis d'emblée, infect their wives.

My thanks are due to Dr. R. B. Nelson, whose notes on one of the cases have been quoted.

July, 1947. A. O. F. Ross.

Reference

Ross, A. O. F. (1939), *British Medical Journal*, **1**, 415.
Leeming, J. A. L. (1947), *Brit. J. Ven. Dis.*, **33**, 163.

The Minister of Health has received letters of thanks from the French Minister of Industrial Production and the Minister of Public Health for medical help given after the Lorraine mining disaster in January. The Ministry granted facilities for Sir Archibald McIndoe, the plastic surgeon, of Queen Victoria Hospital, East Grinstead, and Squadron-Leader F. T. Moore, R.A.F. Medical Service, who is working with him, to fly to the scene of the disaster. The Ministry also arranged for large supplies of plasma from the National Blood Transfusion Service to be flown across for use in treating casualties. The French Minister of Production in his letter to Mr. Bevan wrote: "This outstanding assistance, so spontaneously extended, has been appreciated in all its value, and both the Government and the nation feel it to be yet another sign of the friendship which binds our two countries."

Reviews

GUIDE FOR HOUSE-MEN

Preoperative and Postoperative Care. By William J. Tourish, M.D., F.A.C.S., and Frederick B. Wagner, Jr., M.D. Foreword by Thomas A. Shallow, M.D. (Pp. 350; 87 illustrations. $6.00 or 33s.) Philadelphia: F. A. Davis Company. London: H. K. Lewis and Co. 1947.

This work is written as a guide to the young resident hospital officer to help him to supervise the pre- and post-operative treatment of surgical cases. The first two chapters are on the general principles of pre- and post-operative care; the third contains more detailed discussion of the same principles in so far as they refer to specific groups of surgical cases. In the remaining five chapters—slightly more than half the book—the authors consider in detail the technique of bedside procedures, and it is here that they will chiefly interest British readers.

It is difficult to discuss a book which emphasizes so markedly the fundamental difference between the American and the British outlook. The young intern is given advice in such abundant detail that little room is left for him to think. The patient is set upon with such scientific enthusiasm that he has little chance to eat, drink, belch, pass wind, or get better by himself. It is a little alarming to think that the recently qualified doctor who needs to refer to this extensive catalogue is yet able to call on every department of the hospital to carry out elaborate, expensive, distressing, and not necessarily helpful investigations on his patients. Certain differences between American and British practice make strange reading. Americans like spinal analgesia; most of us detest it. They like subcutaneous infusions; we abandoned them when Lane retired about the beginning of the first world war. They regard proctoclysis as out of date; we still cling to it as the most useful method of giving fluids next to the oral one. They keep in their stitches and drains at least half as long again as we do. They have replaced manual labour by the machine even to the extent of looking for metastases of gastric carcinoma with the sigmoidoscope rather than the finger (p. 113).

The book is excellently produced and illustrated. The second half, where the authors give detailed instruction for such procedures as intubation, catheterization, lumbar puncture, therapy with anticoagulants, refrigeration analgesia, and the investigation of patients admitted with head injuries, will be instructive to any surgeon or surgical registrar. Chapter V, on the management of the patient with urological disease, is particularly good.

HENEAGE OGILVIE.

HAEMOTHERAPY

Tratado Practico de Hemoterapia. By Dr. Emilio S. Sammartino *et al.* (Pp. 831; illustrated. No price.) Buenos Aires: Vazquez. 1947.

The authors of this comprehensive volume on haemotherapy cover in eighteen sections all aspects of the subject, beginning with a historical outline and ending with a full description of the organization and maintenance of a transfusion service for a large city. Each section is set out methodically and has its own bibliography. The type and paper are excellent. The illustrations, of which there are many, are clear and fully explained in the text. Dr. Sammartino has had the help of seven of his colleagues in the production of his book, and the author or authors of each section are named.

Too often—no doubt owing to the language difficulty—South American authors have ignored the work of British medical men, but no such complaint can be made in this case. In the field of haemotherapy, from the earliest experiments down to the latest developments—stimulated by war—Englishmen have been prominent, and they receive full credit here; indeed, the only portraits are of Richard Lower and James Blundell. After Harvey's demonstration of the circulation of the blood it was realized that transfusion of blood from one animal to another was a practical proposition, and Lower successfully achieved this in dogs. Such experiments occupied the Royal Society a good deal in its early days, and Pepys, who attended regularly and was later President, speculated in his diary in November, 1666, on the possible effects of transfusing blood from a Quaker into an archbishop. It was not until 150 years later, however, that Blundell was able to demonstrate the therapeutic possibilities of blood when he performed the first indirect transfusion of human blood into a patient of his in Guy's Hospital in 1819. Yet another hundred-odd years passed before Marriott and Kekwick showed the value of continuous drip transfusion and Whitby simplified and organized its technique for use on the vast scale required for war. The subject of haemotherapy is enormous, but this book covers it in detail. Dr. Sammartino is to be congratulated on his achievement.

A. MORTON GILL.

MATRICIDE

Dark Legend. A Study in Murder. By Frederic Wertham, M.D. (Pp. 119. 6s.) London: Victor Gollancz, Ltd. 1947.

In our generation psycho-analysis has emerged from the consulting-room to enter the law courts and the theatre, the world of back-room tragedy and classic drama. Dr. Wertham, a distinguished psychiatrist of Boston and New York, provides in this little book a study of matricide which bridges these distant worlds. He tells the story of Gino, a young Italian in New York who murdered his mother and was tried for his crime, but who on Dr. Wertham's plea of insanity escaped the electric chair. He analyses Gino's unconscious motives and thus illuminates the problem of Hamlet and Orestes, and defines an Orestes-complex—an off-shoot of the Oedipus conflict, in which the love of a son for his mother is turned to destructive hate by her unfaithfulness to the memory of her dead husband with whose image the son has identified himself. Gino's sordid history derives an exogenous dignity from these noble analogies and even his pigeon-Americanese thereby loses its emetic quality. For example his confession, "I killed her. . . . I stabbed her in the neck. . . . I was always happy since the day I killed her. I was glad I done it," becomes in the play of Aeschylus, *The Eumenides*:

> "I slew her. This is not to be denied . . .
> With sword edge pressed against her throat . . .
> And to this hour I am well content with all. . . .
> I fear not."

But the gain is not all Gino's, and his story supplies Dr. Wertham with a key to the dramas of Shakespeare and the Greeks which is profoundly satisfying. This book can be recommended to those whose interest in crime lies in the deviation of human personality rather than with the material ingenuities of detective fiction. It was a surprise to discover the name of Norman Moore, *St. Bartholomew's Hospital Reports*, in the long and learned bibliography. Que faites-vous, Norman Moore, dans cette galère of Shakespearean criticism, Greek drama, and psychiatric textbooks? Curiosity supplied the answer. The reference concerned Dr. Timothe Bright, sometime physician to St. Bartholomew's Hospital, who published in 1586 *A Treatise of Melancholie*, wherein depression was first related to feelings of guilt.

D. V. HUBBLE.

BLOOD PRESSURE

Blood Pressure and its Disorders, including Angina Pectoris. By John Plesch, M.D., L.R.C.P.&S.(Edin.&Glas.). Second edition, revised and enlarged. (Pp. 307; 125 illustrations. 21s.) London: Baillière, Tindall and Cox. 1947.

This revised and enlarged edition is written in authoritarian style and is in no sense a textbook. The author considers only those subjects of which he has made a lifelong study—namely, the arterial blood pressure, the venous pressure, and angina pectoris. In the first section he describes the behaviour of the blood pressure in various physiological and pathological states according to data furnished by his tonoscillograph. Unaccustomed as we are to this instrument, we can but profit by reading about the observations and conclusions obtained by the chief exponent of its use. Numerous tonoscillograms illustrate the text. In his interesting section on the venous pressure the author takes the physiologist's view that elevation of the venous pressure is a compensatory mechanism designed to increase

diastolic filling of the heart and therefore the cardiac output. In the section on angina pectoris he incorporates a good deal of material with which few British cardiologists would agree. Thus he attributes brown atrophy, fatty degeneration, and nocturnal and postprandial angina pectoris to myocardial congestion (p. 157), and the opaque triangle at the left cardiophrenic angle often seen in skiagrams of the heart to pericardial hydrops (p. 159 : Figs. 33 and 75).

He regards arteriosclerosis as being a compensatory structural change to protect the arteries from undue pressure and pulsation, calcification being especially successful in this respect (p. 161) ; in fact, he states that coronary calcification and angina pectoris are more or less mutually exclusive (p. 165). He says that plethora up to twice the normal blood volume is a common pre-arteriosclerotic finding (p. 163). On p. 176 the following statement appears : "The angina pectoris of myocardiac origin may be conditioned by rheumatism, syphilis, pericarditis or toxic processes. An especially important symptom for this complex of diseases is a relative insufficiency of the cuspis valves, which can be detected as a loud diastolic murmur over the ostium atrio-ventriculare mitralis." This is a fair example of a number of such confusing statements. Mitral incompetence due to endocarditis is said to give rise to a late systolic murmur strongest at the end of systole, whereas functional mitral incompetence is said to give rise to an earlier murmur which, in contrast, may be regarded as presystolic (p. 176). An unusual therapeutic measure is the treatment of angina pectoris by means of infiltrating the pectoralis major and minor with normal saline. Italicized remarks such as, "*In order to be effective, treatment for arteriosclerosis must be undertaken in the horizontal position as a conditio sine qua non,*" leave the British reader somewhat bewildered. There are very readable discourses on alcohol and tobacco, a useful chart for a low-salt diet, and an interesting appendix where the author describes the technical details of his tonoscillograph and blood-gas analyser.

PAUL WOOD.

INFANT FEEDING

Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine. By P. C. Jeans, M.D., and Williams McKim Marriott, B.S., M.D. Fourth edition. (Pp. 516; illustrated. 32s. 6d.) London: Henry Kimpton. 1947.

The death of W. McKim Marriott was a tragedy, but fortunately his teaching and writings on infant nutrition have been preserved in his pupils and in his books. Prof. P. C. Jeans, of Iowa, was associated with Marriott for some years, and he has already brought out a revised version of *Infant Nutrition*, now appearing in a fourth edition. Early in the book he makes the essential point that the chief cause of failure in infant feeding is to provide the equivalent of too few calories. Too much attention is paid to vitamins and minerals and too little in general to adequate energy intake. However, the author of this book is not altogether free from blame in this respect, for the sections on vitamins are together longer than those on energy metabolism, and he might have emphasized more the modern revived interest in the quality and quantity of protein. The metric system is used in the section on "formulas" but with the usual equivalents (ounces) in brackets. As usual in countries in which the cubic centimetre or gramme is not used in the home the whole business is artificial—quantities being obviously worked out in convenient ounces and translated, as it were, into metric equivalents. The account of dried milk might be given more space now that it is being extensively used in Europe.

These criticisms of the book must not be allowed to obscure its usefulness and value Marriott's lactic-acid milk and the whole plan of infant feeding based on his ideas, as well as the emphasis placed on parenteral infections in causing diarrhoea, have passed into standard paediatric practice. Hartmann's solution (also from St. Louis) is in everyday use ; the work of Darrow is mentioned in this connexion. More stress might have been laid on water and mineral metabolism, with reference to Gamble's work in Boston. The author concludes with an excellent miscellaneous section on practical procedures. The book can be thoroughly recommended to those concerned with the care of young children.

ALAN MONCRIEFF.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Maladies de la Colonne Vertébrale. By J. Saidman. Vols. I and II. (Pp. 1,244. Bound in one volume 4,500 francs; in two volumes 4,750 francs.) Paris: G. Doin. 1948.

The pathology, diagnosis, and treatment of diseases of the vertebral column.

Technique d'Irradiation des Tumeurs Malignes. By C. Guilbert. (Pp. 299. 650 francs.) Paris: G. Doin. 1947.

An account of the application of radiotherapy and the doses required.

Le Syndrome de Diabète Rénal. By R. Debré. (Pp. 64. 145 francs.) Paris: G. Doin. 1947.

A monograph on renal diabetes, with particular reference to glucoside metabolism.

Éléments de Puériculture. By B. Weill-Hallé. (Pp. 260. 450 francs.) Paris: L'Expansion Scientifique Française. 1947.

The health and feeding of children described for parents and nurses.

Über Mangelerkrankungen. By Prof. A. Wolff-Eisner. (Pp. 51. No price.) Wurzburg: Lothar Sauer-Morhard Verlag. 1947.

The author describes his experience of deficiency diseases among the inmates of a concentration camp.

Rhumatisme Articulaire Aigu. By R. Lutembacher. (Pp. 438. 1,000 francs.) Paris: Masson. 1947.

A monograph on acute rheumatic disease.

La Radiothérapie Anti-Inflammatoire. By J. Huguet. (Pp. 200. 440 francs.) Paris: G. Doin. 1947.

A monograph on the *x*-ray treatment of inflammation.

Studie zur Frage der Zunahme der Sulfonamid-Resistenz bei der Gonorrhoe. By Dr. Med. E. Bruens. (Pp. 75. Rm. 4.) Berlin: Berliner Medizinische Verlagsanstalt. 1947.

An account of the experimental investigation of resistance to sulphonamides.

Polycories. By R. Debré. (Pp. 126. 215 francs.) Paris: G. Doin. 1947.

A clinical account of certain metabolic disorders.

Nouvelles Techniques de Traitement des Fractures. By H. Godard and R. Michel-Bechet. (Pp. 406. 1,500 francs.) Paris: G. Doin. 1948.

The authors describe their methods of diagnosis and treatment of fractures.

Modern Methods of Amputation. By E. Vasconelos. (Pp. 253. 61s. 6d.) Bognor Regis: John Crowther. 1945.

A practical account of amputation, with many illustrations.

Die Sauna. By Dr. Med. V. R. Ott. (Pp. 224. 15 Swiss francs.) Basle: Benno Schwabe. 1948.

A general account of the Finnish practice of steam baths.

Whitaker's Almanack, 1948. (Pp. 1,092. Cloth bound, 12s. 6d. ; paper bound shorter edition, 7s. 6d.) London: 1948.

New and enlarged edition.

Fantasias del Pensamiento Medico. By E. D. Andia. (Pp. 157. No price.) Buenos Aires: Ferrari. 1947.

A discussion of the relation of man to his environment.

Pathologie des Zones Pulmonaires. By H. Warembourg and P. Graux. (Pp. 141. 380 francs.) Paris: Masson. 1947.

A monograph on "pulmonary zones" in relation to diseases of the lung.

Anatomie Radiologique Normale. By H. Tillier. (Pp. 233. 600 francs.) Paris: G. Doin. 1947.

An account, with many diagrams, of normal human anatomy as shown by *x*-ray photography.

L'Exploration de la Fonction Respiratoire. By J. Arnaud *et al.* (Pp. 317. 425 francs.) Paris: Masson. 1947.

A review of the literature, intended for the clinician.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY APRIL 10 1948

AN AMENDING ACT

Two resolutions approved on March 22 by the Comitia of the Royal College of Physicians under the continuing presidency of Lord Moran were forwarded to the Minister of Health and have since been published. They are:

(1) "The College affirms its desire for unity and recognizes that the comprehensive health service cannot be successful without the willing co-operation of all branches of the profession. The College believes that this can be furthered if the Minister of Health makes clear in an amending Act that a whole-time service shall not be brought in by Regulation; so that if any future Government desires to introduce such a service, a fresh Act of Parliament would be required. The College reaffirms its opposition to a whole-time medical service.

(2) "A principal cause of the present discontent with the National Health Service is the power possessed by the Minister of Health to change its character by Regulations. The College therefore suggests that an amending Bill should be introduced to make Regulations affecting the National Health Service subject to special procedure."

These resolutions have been further supported by Mr. William Gilliatt, P.R.C.O.G. Sir Alfred Webb-Johnson, P.R.C.S., has communicated to the Minister the views of the Council of the Royal College of Surgeons and has pointed out "that while the legislation suggested would relieve members of the medical profession of one of their most serious apprehensions, it would not by itself be sufficient to secure the willing co-operation of all branches of the profession."

The Minister should no longer be in doubt about the feeling of the profession. When the Negotiating Committee entered into discussions with the Minister over a year ago it did so with the proviso "that such discussions are comprehensive in their scope, and that the possibility that they may lead to further legislation is not excluded." Shortly afterwards the Minister informed the Negotiating Committee that he did not withhold the possibility of amending legislation. He reaffirmed this view in his very full reply to "the Negotiating Committee's Case" when both of these documents were published in December last.

There followed the recent plebiscite with a 9 to 1 majority in an 84% poll of the whole profession indicating disapproval of the National Health Service Act in its present form. Faced with this overwhelming evidence of support for its policy and for that of the Negotiating Committee the Special Representative Meeting held last month might well have adopted an attitude as intransigent as Mr. Bevan's has been in the past. Wisely, however, the representatives continued to behave, in Dr. Dain's words, as "reasonable people." There was passed unanimously as a resolution the recommendation put before the Special Representative Meeting by the Council of the B.M.A. This resolution urged that changes should be made in the National Health Service Acts of 1946 and 1947 and expressed the hope that by making such changes the Government would make it possible for the profession to co-operate. While reaffirming "the whole-hearted desire of the medical profession for a comprehensive health service available to everyone," the Representative Body indicated the essential changes needed as those necessary "to maintain the integrity of Medicine and to prevent doctors being turned into State servants, with harmful consequences to patient and doctor alike." These changes were demanded because, among other things, as the Chairman of Council said, "The Minister's power in this Act is absolute."

The Minister has power to alter by Order or Regulation the fundamental terms of service of the medical profession. Such power is without precedent in the medical history of this country and gravely threatens the freedom and the traditions of an old and independent profession. This fundamental point was taken up in a number of resolutions which the Royal College of Physicians of Edinburgh made public on March 26 and submitted to the Prime Minister. Now the views of the Royal College of Physicians of London echo the demand for an amending Bill which has already been put forward.

Mr. Bevan has been engaged in setting up a legal committee to inquire into the effect upon partnerships of certain Clauses in the present Act. He has said that "if there is evidence that existing partnerships are unfairly prejudiced by the Act, he will proceed at once to seek an amendment of it." He may well have made a statement in Parliament on this point by the time this issue of the *Journal* appears. An amending Bill which clarified the position of existing partnerships and which so limited the powers granted to the Minister under the present Act as to make it impossible for Mr. Bevan or any future Minister to create a whole-time salaried Service by Regulation would do something to narrow the gap between the views of the profession and of the Minister, setting at rest one of the justifiable fears of both general practitioners and consultants and specialists. It alone would not ensure, however, that co-operation which the profession and the Minister both earnestly desire. It would not, as *The Times* holds, "go a long way towards meeting the demands of the B.M.A." This can be unhesitatingly affirmed, and indeed is made abundantly clear in a letter signed by the Chairman of Council and published elsewhere in this issue (p. 699).

Regulations issued last week laid down the mode of remuneration for general practitioners and provided for the payment of a universal basic salary of £300 for all practitioners taking service under the scheme. This element of basic salary has done nothing but provoke distrust. Mr. Bevan himself in the debate on Feb. 9 advanced only one argument in its favour: "that young doctors ought to have the opportunity of living decently whilst they were building up their practices." It has also been argued that a basic salary would help to attract young doctors to under-doctored areas. Under a comprehensive service such as the Act envisages the few inequalities in the present distribution of doctors would almost certainly right themselves. It may be, however, that an element of salary in a few special areas could be justified. The thesis that the young

doctor should be helped by an element of salary for the first few years in practice might also be justified. But the idea that every practitioner should receive a basic salary cannot be justified except as a first step towards the development of a whole-time salaried service.

It seems that an amending Bill may be at least a possibility. Whatever its form it will receive the most careful scrutiny. The profession is prepared to consider any new proposals which would safeguard its essential freedom, but it is certain to regard as unsatisfactory an amending Bill which meets only one of the objections to the Act in its present form.

THE PUBLIC HEALTH LABORATORY SERVICE

The duty of a public health laboratory service is to help the practitioner and the medical officer of health in the diagnosis and control of communicable diseases. The origin, development, vicissitudes, and eventual emergence on a national basis of such a service have been ably described by Prof. G. S. Wilson in his Milroy Lectures published in this and our previous issue. The work of this national Public Health Laboratory Service as now constituted may be subdivided into the following functions: to give the practitioner early and reliable reports on material from infectious diseases in which laboratory investigations can be helpful; to co-operate with the M.O.H. in the investigation of outbreaks of infection and in other epidemiological matters; to ensure by bacteriological examination that the food and drink consumed by the public are safe and clean; and to engage in research directed towards a more effective control of all communicable diseases.

An early and accurate diagnosis in a patient with sore throat or acute diarrhoea may be of great help to the practitioner, not only in his handling of the individual case but in preventing spread of infection to other intimate contacts whether in the home, at school, or at work. In the past the laboratory examination of a throat swab usually consisted in reporting the results of growth on a Loeffler slope —not a very reliable method for the diagnosis of diphtheria nor one which gives any indication of the presence of other harmful bacteria. Nowadays, with selective media, the laboratory can report accurately, usually within 24 hours, on the presence or absence of diphtheria bacilli, haemolytic streptococci, Vincent's organisms, and other pathogens. Diphtheria is now a disappearing disease, but the prudent doctor wants to know if his patient is suffering from streptococcal tonsillitis, which, if it spreads to younger members of the household, may produce serious infection. Early diagnosis also allows prompt and effective treatment. Thus an attack of diarrhoea due to dysentery bacilli responds, if treated early, to sulphonamide therapy, whereas gastro-enteritis of salmonella or virus origin does not. Moreover, early recognition of a child with Sonne dysentery may prevent the spread of this highly infectious disease to other members of the family or to susceptible contacts in day nursery or school. Unfortunately, because the attack is mild, the parent does not often call the doctor, and the doctor does not often seek laboratory aid in these diarrhoeal conditions. Their more active co-operation would help the laboratory to sort out the various types of enteritis and give fresh information on the mode of spread of Sonne dysentery, which is again rapidly increasing in incidence after a remarkable decline during the past 12 months. Practitioner and bacteriologist should also be co-operating more closely in the attack on tuberculosis, the most important of all infectious diseases. The only sure method for the diagnosis of pulmonary tuberculosis is the demonstration of tubercle bacilli in the sputum, and any adolescent or adult patient with persistent productive cough should have his sputum examined bacteriologically. Again the laboratory, by cultivation of the sputum or, if this is not available, of stomach washings or laryngeal swab, gives much more reliable results to-day than yesterday. Examples of other infections in which with laboratory help an early and accurate diagnosis can be made before clinical signs are sufficiently suggestive are whooping-cough, the pneumonias, and enteric fever. As this laboratory service, together with the sister service in clinical pathology, becomes more widely known and available the practitioner will doubtless make increasing use of these free ancillary aids to diagnosis, and this inevitably will help to improve the standards of domiciliary medicine. To be most effective arrangements should be made for specimens to reach the laboratory on the day on which they are taken so that the bacteriologist whenever possible may telephone a report to the doctor before he starts on his rounds next morning.

This service to practitioners for the diagnosis of individual cases of infection indirectly helps the M.O.H. in his efforts at community control. More direct help is given by the public health laboratory in the investigation of outbreaks of scarlet fever or diphtheria in schools, gastro-enteritis in day nursery or maternity department, food poisoning in school or factory canteen, measles or whooping-cough in day or residential nursery, and enteric fever occurring sporadically or in epidemic form. Until recently the M.O.H. has been too preoccupied with other matters, and laboratory facilities have not been available for this kind of applied epidemiology, but perusal of the many records of outbreaks reported in the *Monthly Bulletin* (inaugurated by the Public Health Laboratory Service and now carried on jointly with the Ministry of Health) indicates how valuable has been the laboratory excursion into the field. This co-operation with the M.O.H. as guardian of community health has been one of the most remarkable developments of the Public Health Laboratory Service during and since the late war, and with the help of the Reference Laboratories, which vie with Scotland Yard in intricate methods of detection, has added considerably to our knowledge of the sources, modes of spread, and methods of control of outbreaks of infection. Among the results achieved may be mentioned effective control of diphtheria outbreaks in schools, field trials of new antigens for immunization against diphtheria, typhoid fever, and whooping-cough, elucidation of the sources of salmonella and staphylococcal outbreaks of food poisoning, and the rapid and reliable laboratory diagnosis of smallpox. An illustration

of the way in which the service tackles questions of topical interest is given in a letter which appears in our correspondence columns this week over the signature of Dr. F. O. MacCallum. This describes the research undertaken at the Virus Reference Laboratory to determine whether there was any evidence of relationship between last year's epidemics of poliomyelitis in man and encephalitis in dogs. No relationship was discovered.

The third function of the public health laboratory is the bacteriological examination of water, milk, ice-cream, and other foodstuffs, either to ensure that these articles conform to certain standards of cleanliness or to find if they contain actual or potentially pathogenic bacteria which have caused or may cause infection. Thus the frequent demonstration by the laboratory of tubercle bacilli in milk has been a potent factor in the public demand for pasteurized or tuberculin-tested milk, while the more recent phosphatase test has proved a valuable check on the efficiency of pasteurizing plants. There is as yet no bacterial standard for ice-cream, but the laboratory evidence about outbreaks of food poisoning and enteric fever attributable to ice-cream has been one of the main reasons for the present "cleaning-up" in the manufacture of this commodity. The increased incidence of food-borne infections associated with the great increase in communal feeding, together with the more frequent use of prepared foods and perhaps lowered standards of both public and personal hygiene, has shown the need for more education of the food handler in food hygiene, and here again the Public Health Laboratory Service is playing a leading part. Indeed, an important function of the service will be the dissemination of knowledge on recent advances in preventive medicine, whether to undergraduate or postgraduate, general practitioner or M.O.H., sanitary inspector or health visitor, so that there will not be that delay which Mellanby has lamented between a medical discovery and its application, especially when the discovery is one that provides an immediate opportunity of preventing or even eliminating disease.

It was a fortunate choice for the new service that from its beginning it came under the control and direction of the Medical Research Council, which with flexibility and understanding has encouraged its development from tender infancy to lusty childhood. It was fortunate, too, that its directors were men of such sagacity as W. W. C. Topley and G. S. Wilson, for they each in turn realized that the success of the service depended primarily on its personnel. First-class men and women with university and research experience were picked to inaugurate the emergency wartime service, and now new recruits of ability are being carefully chosen and even more carefully trained to fill the gaps caused by steady expansion. Herein lies a danger, for if the service expands too rapidly the staff will be so preoccupied with routine duties that there will be too little time and thought and energy left for experimental and field studies. These researches are essential to keep the Public Health Laboratory Service the live and progressive body it must be if it is to maintain the traditions established by such pioneers as Klein and Power, Houston and Delépine, Sims Woodhead and Mervyn Gordon, Scott and Griffith.

PROGESTERONE AND THREATENED ABORTION

During recent years it has become almost a rule to treat all cases of threatened and habitual abortion with progesterone irrespective of their aetiology. Although many general claims have been made, the value of this form of treatment as judged by the results of a large series of carefully controlled cases has never been convincingly demonstrated. Indeed many clinicians have expressed the view that despite all theoretical considerations the introduction of progesterone therapy has not improved their overall results, and a few have gone so far as to state that the injection of the hormone sometimes appears to precipitate abortion. Such observations, which at one time almost savoured of heresy, have received support from research workers, for there is now confirmed experimental evidence to show that progesterone, in the human being at least, does not diminish the contractions and sensitivity of uterine muscle as was formerly believed. The character of the contractions is altered, but instead of being suppressed they occur at regular, if less frequent, intervals and have a high amplitude. The matter is still open to controversy, but this view is supported by other observations. Thus it is now fairly well established that contrary to earlier ideas spasmodic dysmenorrhoea is not the result of defective corpus luteum activity. Indeed it occurs only when the uterus has been subjected to the influence of progesterone, and absence of pain is characteristic of anovular menstruation.[1 2] This again is in keeping with the almost universal clinical experience that progesterone therapy is valueless in the treatment of spasmodic dysmenorrhoea.

If progesterone therapy can no longer be regarded as a "uterine sedative" its use in the treatment of threatened and habitual abortion needs careful review. This is again emphasized by Dr. S. Bender, who in this issue of the *Journal* reports on the practical application of a pregnanediol excretion test in threatened abortion. Abortion has many causes, and in only a limited number of cases is progesterone deficiency discovered by routine assays of the excretion of pregnanediol or its ester in the urine. Moreover a fall in pregnanediol excretion does not necessarily mean that shortage of progesterone is the cause of the abortion, it may be the result of the death of the foetus *in utero*. Excluding the latter cases, Bender confirms previous findings that only about 38% of cases of true threatened abortion show evidence of progesterone deficiency. If progesterone therapy is limited to these, abortion, he says, can be averted in approximately 80% of cases, whereas if progesterone is administered indiscriminately to all cases of threatened abortion the cure rate is only 55%—a figure almost identical with that obtained when progesterone is not used at all. The conclusion is that this form of treatment is not only valueless but is harmful if the patient is not suffering from progesterone deficiency, and should be reserved for those cases in which the pregnanediol excretion rate is low. In these, it is suggested, the efficacy of the treatment depends not on the action of progesterone on the uterine muscle but on the part it plays in chorio-decidual relationships and the proper nutrition of the embryo.

The contention that the selection of cases of threatened abortion for progesterone therapy would considerably improve the foetal survival rate is not new. However, the original gravimetric method of estimating pregnanediol in

[1] Wilson, L., and Kurzrok, R., *Endocrinology*, 1938, **23**, 79.
[2] Wilson, L., and Kurzrok, R., ibid., 1940, **27**, 23.
[3] Bender, S., *J. Obstet. Gynaec. Brit. Emp.*, 1947. **54**, 783.
[4] *Lancet*, 1947, **2**, 701 ; *J. Endocrinol.*, 1948, **5**, 247.
[5] *J. clin. Endocrinol.*, 1947, **7**, 351.
[6] Morrow, A. G., and Benua, R. S., *Amer. J. Obstet. Gynec.*, 1946, **51**, 685.

the urine is so difficult and time-consuming that the clinical application of the idea has not hitherto been practicable. The colorimetric method introduced by Guterman is a rapid and comparatively simple laboratory procedure but has the disadvantage of being far from accurate. Its accuracy may depend to some extent on strict adherence to detail and on the use of a photo-electric absorptiometer,[3] and it might be improved by such modifications as have been suggested by Somerville, Gough, and Marrian,[4] and Mack and Parks.[5] Even so, Bender found it unreliable for the diagnosis of pregnancy, and this is also the experience of Dr. W. H. H. Merivale, whose observations are published elsewhere in this issue, and of other workers.[6] Indeed for this purpose all methods of pregnanediol assay are likely to give unreliable results, because the amount excreted during early pregnancy is variable and is not always significantly greater than that found in the urine whenever there is active corpus luteum tissue in the ovary and in other conditions such as adrenal cortical overactivity. Also there may be individual variations in the metabolism of progesterone, and the output of pregnanediol does not always reflect the amount of progesterone in circulation. If, however, the Guterman test is adequate for the purpose of differentiating proved cases of threatened abortion into those in which progesterone therapy may be helpful and those in which it definitely will not, it should be of real value to the clinician. In practice, and to permit a proper interpretation of the result, it would seem desirable to carry out a biological test for pregnancy at the same time.

The demonstration that progesterone will not prevent abortion resulting from non-endocrinological causes has many practical implications. It should at least go some way to allay the fears of those who in the past have postulated that its routine employment might result in the live birth of more abnormal foetuses—foetuses which otherwise would have been aborted spontaneously at any early stage in pregnancy.

THE PROBLEM OF CARIES

Absorption of bone in the tissues and the dissolution of enamel in the mouth present fundamentally the same problem, for the difference between bone and enamel is one of degree rather than of quality—both are built up by the deposition of calcium phosphate crystals on a protein matrix. Thanks mainly to the work of R. Robison physiologists have a fairly clear conception of the method of bone formation, but the method by which it is absorbed has remained as baffling a problem as that of caries. As Dr. P. Pincus points out elsewhere in this issue (p. 687) the dissolution of both enamel and bone could be brought about either by the action of an acid with the production of a soluble salt of calcium, or by an enzyme with the power of lysing the protein matrix, and so in effect leaving the fine crystals of calcium phosphate without support.

While few, if any, physiologists or pathologists would accept a suggestion that bone absorption was due to decalcification by an acid, many dental research workers still refer to caries as a process of decalcification—a deduction based upon the knowledge that mouth bacteria can produce an acid by their action on carbohydrates, and the belief that enamel is so well calcified that its protein matrix is of little significance. Recent work, particularly that of H. E. Frisbie, indicates that this conception is far from the truth and that the organic portion may be quite as important a factor in the breakdown of enamel as it is in bone. It is on such lines that much of the research work on caries is now being done in the U.S.A. An important guide to this new approach was the observation made by Pincus[1] in 1937 that he had been able to bring about the dissolution of enamel by bacterial action in an alkaline medium. The significance of this work, which shatters the hypothesis of decalcification, is only now becoming apparent. In his article in this issue Pincus indicates that a common mouth organism of the *Proteus* group can produce an enzyme that will bring about the disintegration of bone or cartilage acting in a neutral medium. It is not of course suggested that the absorption of bone *in vivo* has necessarily anything to do with bacterial action. But the fact that an enzyme can act in this way suggests that a profitable line of research might be to attempt the extraction of a similar enzyme from tissue containing osteoclasts.

One of the few factual observations that can be made at present about caries is that it occurs mainly in stagnation areas. The fissures on the occlusal surface of the first molars are the commonest sites. On eruption these fissures are filled with an organic material, and they become stagnation areas only when this keratinized tissue has been lysed away. It would be interesting to know whether the enzyme produced by the *Proteus* organism is capable of doing this. If so, then this most recent work by Pincus may go some way in helping to solve the difficult and elusive problem of caries.

HAEMOPHILIA

One of the wartime publications of the Institute of Human Genetics of the University of Copenhagen deals with haemophilia. This valuable study, carried out by Andreassen,[1] became known in this country only after the war was over. Andreassen set out to discover every person in Denmark who was known to suffer from haemophilia, including those recently dead, and believes that this aim was attained. The total number of families was 63, containing 205 haemophiliacs. The frequency of the disease in males (if we allow an average length of life one-third of that of normal males) is 1.3 per 10,000. Haldane[2] pointed out that the rate of elimination of the gene for haemophilia must be considerable, for one-third of such genes are in the *x*-chromosomes of affected males, who tend on the average to be of low fertility. The loss of genes is balanced by fresh mutation, and the life of the average haemophilia gene, once it has appeared by mutation, is not much more than about three generations. Andreassen's estimate of the mutation rate is 1 in 53,000 per *x*-chromosome per generation.

One of the most remarkable results of this study is the development of a technique, originally used by Bürker, for the measurement of coagulation time. The essential feature of Andreassen's method is to determine not the beginning but the end-point of coagulation. He has thus been able, for the first time, to demonstrate unequivocally a difference between normal blood and the blood of the heterozygous female carrier. The average coagulation time of blood taken from 81 normal individuals was 8.2 minutes, while in the case of 19 known carriers it was 16 minutes. Actually there was no overlapping, the longest normal time being 10 minutes and the shortest carrier time 10.5. It has often been suggested that carrier women may be somewhat more prone to bleeding than the normal, a subject about which Andreassen is cautious, but his observation tends to confirm this view. Incidentally he agrees that there is no authentic case of a female haemophiliac; in the very rare

[1] *Brit. dent. J.*, 1937, **63**, 511.

[1] *Opera ex Domo Biologiae Hereditariae Humanae Universitatis Hafniensis.* Vol. 6. Haemophi i Danmark (with English Summary). Copenhagen, Ejnar Munksgaard, 1943.

[2] *J. Genet.*, 1935, **31**, 317.

[3] *Ann. Eugen, Camb.*, 1947, **13**, 262.

instances in which the appropriate genetic constitution might have been present a dose of the gene on both *x*-chromosomes has presumably led to a non-viable embryo. The practical importance of this work, if, as is to be hoped, the technique yields equally good results in the hands of the general pathologist, is the help it offers to the sister of a haemophiliac. At present such a woman can be told only that there is a 50% chance that she is a carrier. It would be a great advance if half the sisters of haemophiliacs could be told that they are free of the gene and can safely have children.

As with other volumes in this series the individual case-histories are given in much detail, so that the original record is available for other research workers. Haldane[3] has made a detailed study of Andreassen's data, and, while in the main confirming his conclusions, considers that they should be modified in certain respects. Andreassen estimates the fertility of haemophilic men as 0.57 of the normal; Haldane arrives at the lower figure of 0.29. Instead of a frequency of mutation of 1 in 53,000 *x*-chromosomes per generation Haldane gives an estimate of 1 in 31,000. Haldane draws a further interesting conclusion. The great majority of mothers of haemophiliacs, even of sporadic cases—i.e., those due to a recent mutation—prove to be heterozygous. This means that the mutation must have occurred a generation earlier. Thus it would appear that the mutation rate is considerably greater in men than in women; it may be about 1 in 100,000 *x*-chromosomes per generation in women and no less than about 1 in 10,000 in men. Thus the normal course of events is a mutation in the *x*-chromosome of a man who hands on the mutant gene to a daughter; the trait then becomes manifest for the first time in her sons. From the practical point of view this is unfortunate, for the great majority of sisters of haemophiliacs have the ordinary 50% chance of being carriers even when the affected brother is the first haemophiliac to appear in the family group.

FACTORIES BILL

"Examining surgeons" under the Factories Act will in future be known as "appointed factory doctors." This is the substance of one of the clauses of the new Factories Bill which the Government has introduced in the House of Lords. The object of the Bill is to make a number of amendments to the comprehensive amending and consolidating Factories Act of 1937. It is proposed that the requirement that young persons under 16 taken into employment in a factory shall be certified fit for that employment will in future be extended to all young persons entering factory employment for the first time. Re-examination will be required at least once a year, and this and other provisions will be applied also to young persons employed in the loading, unloading, and coaling of ships; on other work on ships in a harbour or wet dock; on building operations; and on engineering construction. This extension of the scope of first and subsequent medical examinations will be a step towards implementing an International Labour Convention of 1946. The 1937 Act gives the Minister special powers to require arrangements for medical supervision if he suspects risk of injury to health on one or more of various grounds specified in the relevant section. The Bill applies the same powers more widely—for example, it will allow the Minister to require medical supervision because of the arrival of a consignment of material suspected of being infected, or because of some change in the conditions of work.

Other clauses in this short amending Bill extend the power of courts of summary jurisdiction so that they may make orders for stopping, and also for preventing, the use for factory purposes of premises which are regarded as unsuitable from the point of view of the safety, health, or welfare of the people employed. The 1937 Act also required the provision of "facilities for sitting" for all "female workers whose work is done standing." The Bill proposes to substitute for "female workers" the words "persons employed." Another clause lays down that the appointed factory doctor for a particular district is not legally debarred from acting in this capacity for a particular factory merely because the firm arranges for him to exercise medical supervision over and above the minimum statutory requirements of persons employed there. In view of the prospective disappearance of the Poor Law medical officer who used to act where there was no examining surgeon, this duty will in future be laid on the medical officer of health for the administrative county or the county borough.

The remaining clauses of the Bill amend the safety provisions of the Act on some points of detail; widen the power of the Minister to make special health or safety regulations in relation to, for example, fire-extinguishing equipment which might be dangerous; and allow women and young persons to work on Sunday if the work has to be done without delay in connexion with such perishable goods as fish, fruit, and vegetables. These and other clauses are for the most part concerned with technical details and are intended to meet minor difficulties which have arisen in the working of the Factories Act since 1937.

THE T.U.C. AND THE GENERAL PRACTITIONER

At the Special Representative Meeting held on March 17 Dr. J. A. Brown, of Birmingham, drew attention to certain letters sent by trade unions to medical men in an attempt to make them reveal whether or not they intend to take part in the National Health Service. On March 24 the Council of the B.M.A. considered the reported intention of the Surrey Federation of Trades Councils to seek similar information from doctors, and unanimously passed a resolution condemning the action "as an improper attempt by one section of workers to bring economic pressure on another section, to influence them in the exercise of a free decision granted by an Act of Parliament." The Secretary of the B.M.A. drew the attention of the General Secretary of the T.U.C. to these reports of the Surrey Federation's intentions and to the Council's resolution. The General Secretary replied as follows:

Dear Dr. Hill,

I have received your letter of March 24 complaining of the action of the Surrey Federation of Trades Councils, and enclosing a resolution passed by your Council.

Prior to receipt of your letter we had already written to the Secretary of the Federation intimating that, while it was of course perfectly open to an individual to inquire whether a particular doctor intended to take part in the Service, in our view the proposal to circularize Surrey doctors was inadvisable, and suggesting that they should reconsider the proposal.

Yours sincerely,

VINCENT TEWSON,
General Secretary.

It is unfortunate that guidance of this kind should have to be given to any body representing working men, but clearly in some few cases such guidance is needed, and we welcome the course taken by the General Secretary of the T.U.C.

THE R.C.P. RESOLUTIONS

DR. DAIN'S REPLY

The following letter was sent by the Chairman of Council to "The Times" on April 5 and appeared on April 7.

SIR,—Your generosity in permitting five separate references in your issue to-day to a resolution passed by the Royal College of Physicians a fortnight ago is an indication of the importance which you attach to it. Indeed your medical correspondent, anxious, it seems, to distribute the honours in advance, states that if the Minister of Health now makes the next move the Royal College of Physicians will merit considerable credit for its constructive attitude.

What are the facts? The suggestion that the Minister of Health should introduce a Bill to prevent him or his successors introducing a whole-time salaried service by regulation is not a new one. Over the past few months it has come from a number of individuals and bodies. The central issue is whether such a step would, to borrow the words of your medical correspondent, "go a long way towards meeting the demands of the B.M.A."? Let it be admitted at once that it would meet one criticism, that under the present Act the Minister can by regulation remunerate doctors entirely by salary. It would delay the introduction of a whole-time salaried service by a Government which wished to take this step for a period of time, depending upon the state of Parliamentary business. The result, it is agreed, would be a gain of time. Incidentally not everyone regards such a change as an adequate safeguard, for such a supporter of the Act as Dr. Stephen Taylor, M.P., Parliamentary Private Secretary to Mr. Herbert Morrison, stated in a recent letter to the *British Medical Journal*:

> . . . embodiment of the non-wholetime salary principle in an amending Act would give no protection whatsoever against a Government determined to make the alteration.

It would be unfair to the Minister, to Parliament, and to the public to pass without comment the suggestion that this change, with or without any necessary amendments to remedy faulty drafting of the proviso to Section 35 dealing with partnerships, would "go a long way" towards meeting the views of the medical profession.

In its present form the Act not only makes *ultimately* possible a whole-time salaried service by regulation, but it makes *here and now* a number of changes which the profession sincerely believes to be harmful to the practice of medicine. It is in this field that modification is also necessary. For example, the profession will not accept a universal basic salary for general practitioners, whatever the amount.

In my remarks to the Special Representative Meeting I made clear that the medical profession was willing to consider any proposals which safeguard its freedom. I repeat that statement now. But I should be failing in my duty if I did not make clear that this single change, suggested by many and now repeated by the Royal College of Physicians, would not be regarded by the profession as sufficient and satisfactory.

I may add that contacts between the Minister and the profession need not be circuitous. The representatives appointed by the profession as a whole are prepared to meet the Minister of Health to seek any way out of the present impasse which preserves the profession's essential freedoms.

Yours faithfully,

H. GUY DAIN.

Birmingham.

DESIGNATED TEACHING HOSPITALS

Under the National Health Service (Designation of Teaching Hospitals (No. 1)) Order, 1948, the following have been designated teaching hospitals in the 10 university medical centres outside London:

University of Durham.—United Newcastle-upon-Tyne Hospitals: Royal Victoria Infirmary, Newcastle-upon-Tyne (including the Castle Hill Convalescent Home, Wylam-on-Tyne, Northumberland); Princess Mary Maternity Hospital, Newcastle-upon-Tyne; Babies' Hospital, Newcastle-upon-Tyne; Newcastle-upon-Tyne Dental Hospital.

University of Leeds.—United Leeds Hospitals: General Infirmary at Leeds (including the Ida and Robert Arthington Branch Hospital, Cookridge, near Leeds, and the Roundhay Hall Annexe, Leeds, but excluding the Castleford, Normanton and District Branch Hospital, Castleford, Yorkshire); Maternity Hospital at Leeds; Hospital for Women at Leeds; University of Leeds Dental Hospital.

University of Sheffield.—United Sheffield Hospitals: Royal Sheffield Infirmary and Hospital (including Sheffield Royal Hospital and Fulwood Annexe, Sheffield Royal Infirmary and Edgar Allen Institute); Jessop Hospital for Women, Sheffield (including Firth Auxiliary Hospital); Children's Hospital, Sheffield (including the Children's Hospital Annexe).

University of Cambridge.—United Cambridge Hospitals: Addenbrooke's Hospital, Cambridge (including Addenbrooke's Home of Recovery and Charlotte Rebecca Waley Home of Rest for Nurses, Hunstanton); County Hospital, Cambridge; Cambridge Borough Isolation Hospital.

University of Oxford.—United Oxford Hospitals: Radcliffe Infirmary, Oxford (including Sunnyside Recovery Home, Headington, Oxford, and the Osler Pavilion, Oxford, but excluding the Didcot and District Hospital); Churchill Hospital, Oxford; Oxford Eye Hospital; Cowley Road Hospital, Oxford; City Isolation Hospital, The Slade, Headington, Oxford (including the Old Isolation Hospital and Garsington Smallpox Hospital).

University of Bristol.—United Bristol Hospitals: Bristol Royal Hospital (including Bristol Royal Infirmary, Bristol General Hospital, and Cerne Abbas Convalescent Home, Bournemouth); Bristol Maternity Hospital; Bristol Royal Hospital for Sick Children and Women (including the Jan Smuts Convalescent Home, Burnham-on-Sea, Somerset); Bristol Eye Hospital; Queen Victoria Jubilee Convalescent Home, Bristol.

University of Wales.—United Cardiff Hospitals: Cardiff Royal Infirmary (including the William Nicholls Convalescent Home, St. Mellons, Monmouthshire); Llandough Hospital, Cardiff; Lord Pontypridd Hospital, Cardiff.

University of Birmingham.—United Birmingham Hospitals: Birmingham United Hospital (including the General Hospital, Queen Elizabeth Hospital, Jaffray Branch Hospital; Children's Hospital (King Edward VII Memorial), Birmingham (including St. Cuthbert's Hospital, Malvern); Midland Nerve Hospital, Birmingham; Birmingham Dental Hospital; Birmingham and Midland Hospitals for Women (including the Hospital for Women, the Maternity Hospital, the Women's Convalescent Home, Sparkhill, and the Gertrude Myers Home, Cleeve Prior, Evesham).

University of Manchester.—United Manchester Hospitals: Manchester Royal Infirmary (including the Central Branch, Roby Street, the Private Patients' Home, Royal Infirmary, and Barnes Hospital, Cheadle, Cheshire); St. Mary's Hospitals for Women and Children, Manchester (including St. Mary's Maternity Hospital, Whitworth Street); Manchester Royal Eye Hospital; Dental Hospital of Manchester; Manchester Foot Hospital.

University of Liverpool.—United Liverpool Hospitals: Royal Liverpool United Hospital (including Liverpool Royal Infirmary, the David Lewis Northern Hospital, Royal Southern Hospital, and Liverpool Stanley Hospital); Women's Hospital, Liverpool (including the Hospital for Women, Shaw Street, and the Samaritan Hospital for Women); Liverpool Maternity Hospital (including Hesketh Annexe, Southport); Royal Liverpool Children's Hospital (including the City Branch, Myrtle Street, the Heswall Branch, Heswall, Cheshire, and the Thingwall Branch, Birkenhead); Liverpool Eye, Ear, and Throat Infirmary; St. Paul's Eye Hospital, Liverpool; Liverpool Dental Hospital; Liverpool Convalescent Home, Woolton.

"THE DOCTOR'S CASE"

A clear and simple exposition of the doctors' objections to the proposed health service has been prepared by the B.M.A. in the form of a pamphlet entitled *The Doctor's Case*. The reader will find notes on the structure of the B.M.A. and on the main points of difference between the profession and the Minister of Health, including why the Government wishes to control certification and the effect of that on the patient, why a full-time salaried service would be likely to eliminate free choice of doctor, and why doctors should have the right of appeal from the Tribunal to the High Court on questions of fact. Mr. Bevan's distinction between plucking fruit when it is ripe and plucking it when it is green is recorded, as well as other remarks of his on basic salary in contradistinction to a full-time salaried service and on every doctor being free to decide whether he wishes to enter the new service or not. Medical men will find the pamphlet useful as a basis for discussion with their patients; it will also be of interest to laymen. Copies may be obtained from the public-relations secretaries of Divisions, or from Headquarters.

Reports of Societies

PHYSIOTHERAPY IN POLIOMYELITIS

A meeting of the Section of Physical Medicine of the Royal Society of Medicine was held on March 10, when the subject under discussion was "The Role of Physiotherapy in the Treatment of Poliomyelitis."

Dr. F. S. COOKSEY reviewed the subject in the light of the epidemic of 1947. As yet there was no specific prophylactic or cure for the disease; therefore it was not surprising that promising new methods of treatment were tried, sometimes with the haste which led to exaggerated claims. He supported Seddon's view[1] that no one had ever cured a case of poliomyelitis; all that could be done was to help a process of recovery which was outside their control. Seddon, of course, was referring to the treatment of the disease after the virus had invaded the central nervous system. Dr. Cooksey considered the disease in three stages:

(1) The inflammatory phase when treatment was intended by means of rest and heat to assist nature to localize and arrest the infection, and to relieve pain, and to prevent stiffness or deformity by prophylactic movements.

(2) The stage of potential recovery of variable duration, when the purpose of treatment was to assist the recovery of the paralysed or weak muscles within the limits determined by the permanent damage in the central nervous system.

(3) The stage of chronic disability, when reconstructive operations, appliances, vocational training, and the development of compensatory function in surviving muscles were employed to secure resettlement in an occupational and domestic environment suited to the residual capacity of the individual.

It was important to distinguish the purpose of physiotherapy at each stage. The danger was that physiotherapy would be too vigorous and meddlesome in the beginning and ineffective at the end. Rest from the onset until the infective agent had been destroyed gave nature the best chance to limit the damage. Physical activity of any kind after the onset of infection increased the risk of paralysis. Treatment involving some disturbance of the patient was necessary to mitigate the effects of pain, muscle spasm, and paralysis, stiffness, and contracture, but it must be the minimum while the infection was active. A firm bed, pillows, and sandbags were sufficient to rest most of the muscle groups of the trunk and limbs; exceptions such as the biceps brachialis, dorsiflexors of the hand and foot, intrinsic muscles of the hand, and so on required light plaster or plastic splints. The optimum position for muscles was midway between contraction and relaxation. Normally one full range movement in each direction for all affected joints once or twice a day was all that was required. For the relief of pain moist heat was most effective. Applications of heat twice or at most four times daily were sufficient. Disturbing the patient with two-hourly applications of hot packs together with passive and re-educative movements as advocated by Miss Kenny and others was liable to retard rather than to assist recovery.

State of Potential Recovery

Patient and persistent physiotherapy, in Dr. Cooksey's view, was the keystone of treatment at this stage. Weak muscles should be supported against gravity, especially those of the shoulder girdle, arm, and hand. Sitting-up or ambulation without efficient support should not be permitted, for this threw undue strain on the trunk and leg muscles. Frequent and carefully graduated exercises with intervals of effective rest were important. The paralysed muscles must be kept warm—hot packs, warm baths, or sinusoidal baths seemed to be more useful than radiant heat or diathermy. The main concern was that the damaged muscles should be protected. Full range movements during the course of treatment were valuable both to prevent fixed shortening of the muscles and to stimulate the stretch reflex. In the majority of cases electrical stimulation was of little value, though sometimes it might start a severely paralysed muscle on the road to recovery. Oedema of a paralysed limb should be controlled by elevation, massage, and an elastic bandage or stocking. Massage was useful to assist the circulation of paralysed limbs, but was time-consuming and necessary only in exceptional cases. At some time between six months and two years after the acute phase it became obvious that no further improvement was likely to be obtained in the weak muscles by graduated exercises. Once the limit of improvement had been reached beneficial trick movements should be encouraged and the surviving muscles developed by intensive exercises to compensate so far as possible for those which were paralysed or permanently weakened. Dr. Cooksey concluded on a note of warning against well-intentioned, though not necessarily well-informed, pressure to over-treat patients in the early stages.

[1] *British Medical Journal*, 1947, **2**, 319.

Relief and Re-education

Miss D. B. KIDD repeated much of Dr. Cooksey's advice. Rest, which was essential in the early stages of the disease, was achieved by well-moulded splints of plaster or perspex. Muscle tenderness and spasm were relieved by heat. Wet heat was more efficient than dry. Short-wave diathermy and radiant heat had proved disappointing. She relied largely on hot wet packs, using towels wrung out in hot water and wrapped round the limb or part, the process being continued for from ten to fifteen minutes. To prevent stiffness or deformity each joint was put passively through its full anatomical range of movement twice daily. This treatment was begun preferably not later than forty-eight hours after the onset of the disease and was continued until the acute condition had subsided.

In the convalescent stage before any detailed re-education was instituted a test of voluntary power should be made and the muscles graded accordingly. It was wiser to under-rate than to over-rate the power of a muscle. If fatigue was not observed and progress was satisfactory exercises could be stepped up as required. The first factor in re-education was to train the sense of movement in the mind of the patient, and the speaker gave a detailed description of how this could be done. She mentioned the importance of retraining the postural sense in the upright position. In cases of spinal and abdominal involvement, even when severe, the patient benefited by attempting to maintain the sitting posture for a few moments at a time at an early date. She introduced the taking up of this position over the side of the bed after two or three months. Adequate support was always given, in some cases the patient being literally held up.

The chronic stage was reached only when a patient had ceased to make progress over a period of two or three months, and this might be eighteen months or two years or more from the onset of the disease. This was the stage of residual disability, and fortunately many patients never came to it, making a perfect or almost perfect recovery, and requiring only to be hardened off by class work and occupational therapy before returning to normal life. In the chronic stage emphasis was laid not only on the co-ordination work previously instituted but also on the development of trick actions, which previously had been forbidden. It was preferable not to introduce walking while the patient was still making satisfactory progress in recumbency. When it was eventually started it was remarkable to note in many cases a distinct improvement in some muscles which had seemingly already reached their maximum power.

Electromyographic Findings

Dr. P. BAUWENS, director of the Physical Medicine Department of St. Thomas's, said that although electrodiagnostic methods were of no assistance in the diagnosis of anterior poliomyelitis in the acute phases of the disease they could be of value in establishing the prognosis. Electromyographic exploration of normal muscles was characterized by absence of electrical activity at rest and a very complex electrical disturbance during exertion. The complex nature of the resulting wave-form was due to the fact that motor units entered into activity in an asynchronous fashion and their respective action potentials might fortuitously cancel out or add up. With these two characteristics as the criteria of normality deviations could be observed. In the earlier phases some highly polyphasic discharges could at times be detected, probably an expression of hyper-excitability of an affected

but still operative motor unit. The spasm which appeared to be one of the constant features in epidemics in America and Australia had not been seen in the recent epidemic here, but it was noticeable that the muscles were in a defensive state and responded rapidly to any movement which caused the patient discomfort.

After a lapse of some two or three weeks, when partial or complete denervation of some muscles was established, fibrillation might manifest itself electrically as small repetitive spike potentials. In a resting muscle this was diagnostic of motor unit denervation, and resulted from the autonomous activity of individual muscle fibres as distinct from collective action. The observations of Buchthal and Clemmessen relating to synchronized activity of motor units in paretic muscles had been confirmed. It indicated that the paresis of muscles exhibiting this feature was due to damage in the anterior horn cells. Marked reduction in the number of motor units involved in maximal exertion was shown by a decrease in the interference characteristic of the tracing on the cathode ray oscilloscope. In another type of muscle condition observed in a number of recent cases after recovery the muscle or group showed marked wasting, absence of reflex responses, rapid fatigue on exertion, but good action on volition. Despite the degree of wasting and absence of reflex activity it was impossible to detect any signs of lower motor neurone destruction or any quantitative decrease of electrical activity on electromyographic examination. The speaker thought that damage to internuncial fibres could explain this clinical picture.

THE MEGALOCYTIC ANAEMIAS

At a meeting of the Section of Medicine of the Royal Society of Medicine on March 23, Dr. MAURICE DAVIDSON presiding, the subject for discussion was the megalocytic anaemias.

Sir LIONEL WHITBY first surveyed the problem from the point of view of the haematologist. In cases of anaemia there were two methods of diagnostic approach, one haematological and the other clinical; the integration of the two might suggest both diagnosis and treatment. At first sight the phenomenon of megalocytosis in association with an anaemia might appear to be no more than a simple fact, and the problem was indeed simpler if a megalocytic anaemia were defined as one which was associated with megaloblastic erythropoiesis, but this was not always apparent from examination of the peripheral blood. Moreover, the phenomenon of megalocytosis was by no means always associated with a megaloblastic bone marrow. The majority of preparations which contained liver or its equivalent were effective only when there was megaloblastic erythropoiesis.

The limitations of the various methods for estimating megalocytosis must be appreciated. Some haematologists still regarded a colour index of substantially more than 1 as evidence of megalocytosis, as indeed it was, but an index of less than 1 did not mean that there was no megalocytosis. Some relied upon simple diffraction methods using some form of halometer, but in severe anaemia the halo might be so poor that no accurate reading could be made. Others, accustomed to the magnifications of their own microscope, obtained a very reasonable estimate of megalocytosis by simply examining the film. Certainly that practice should always be used as a supplement to the halometer or other diffraction method, and, of course, the rough estimate of cell size could be rendered exact by the time-consuming Price-Jones procedure, which had the advantage of clearly defining the phenomenon of anisocytosis, itself an important feature when associated with megalocytosis. This academic exercise was now rarely performed, and did not usually throw any light on the diagnosis which could not be obtained by less laborious means. Undoubtedly the most reliable quantitative estimate of cell size was given by the volume determination using a Wintrobe's tube, though here also caution and control were necessary.

The phenomenon of megalocytosis having been found, what further haematological examination was needed before making a diagnosis or instituting therapy when clinical diagnosis was in doubt? A well-marked increase in the size of the red cells was often obtained with what was called a macronormoblastic bone marrow. This state of the marrow was revealed by sternal puncture and provided a pretty exercise in haematological diagnosis demanding differentiation. Sir Lionel Whitby remarked that cell size might be affected by various grades of normoblastic marrow activity and also by such factors as *p*H. It had long been known that acidosis brought about a general increase in cell size while alkalosis had a reverse effect. Obviously with a combination of factors such as renal failure and reaction to haemorrhage much alteration might be produced as a summation effect. It was important not to accept the phenomenon of megalocytosis at its face value. Increase in cell size was no more than a symptom or phenomenon which required explanation in terms of fundamental pathology.

Liver Preparations and Folic Acid

Liver preparations and folic acid were effective only when the anaemia was characterized by a megaloblastic bone marrow. The therapeutic materials now available were liver extract in purified and concentrated form, less concentrated crude liver extracts, oral preparations such as proteolysed liver, and folic acid. None of these substances could be regarded as a complete substitute for one of the others. Each could be properly and specifically employed in megalocytic anaemias which were associated with a megaloblastic bone marrow. Folic acid exerted a remarkable effect in most cases of pernicious anaemia, the sprue syndrome, the megaloblastic anaemia of pregnancy, and nutritional megaloblastic anaemia. However, the effect of folic acid, both prophylactic and curative, on the neurological complications was highly unsatisfactory. The explanation of this was by no means clear. It might be that folic acid lacked something which liver extract contained, since the administration of liver extract relieved the neurological complications. On the other hand, certain American findings suggested that large doses of folic acid appeared to precipitate neurological complications whereas smaller doses did not, or at least not in an acute form. So far as was known, all members of the vitamin B complex appeared to be concerned with complicated enzyme systems and to be largely interdependent. It had therefore been suggested that an excess of folic acid upset the imbalance of vitamin B in the same way as an excess of other members of the complex appeared to reveal or lead to a deficiency syndrome characteristic of some other component. There were obvious dangers in highly specific vitamin therapy. The functional relationship between folic acid and the active principle in liver extracts was obscure, but from the differences in clinical effects, particularly the failure of folic acid to protect the central nervous system, it seemed likely that liver and folic acid were concerned with separate physiological mechanisms, so that the one could not entirely replace the other, even though there was overlap.

The practical outcome so far as pernicious anaemia was concerned was that folic acid had a very limited use, despite the convenience of its administration. It was useful when travelling prohibited the injection of liver extract or when sensitivity to liver extract had developed, but even then its use should be limited to the period of desensitization. The results of treatment with folic acid in the sprue syndrome had been to some extent contradictory and confusing. It was agreed that alimentary symptoms were remarkably benefited, but the haematological response appeared to depend upon whether the marrow was megaloblastic or not, and it was well known that haematological changes in sprue might be extremely variable. Folic acid would always have a place in the treatment of the sprue syndrome, but should be used to supplement rather than to replace other therapeutic measures.

Each of the four types of preparation he had named had its use, but their mode of action was not clear. Folic acid was obviously a simpler material than complex liver preparations. For the moment the prescription of one or other must be dictated by clinical experience rather than by pharmacological knowledge. The trend of thought was that many enzyme systems were involved in blood formation, and the predominance of one single vitamin might upset the co-ordination of the whole complicated system or even exert an inhibitory action on other groups. It might well be that liver extract and crude preparations of liver contained a well-balanced mixture of elements such as was required by many of the enzyme systems.

Activity of Liver Extracts

Dr. J. F. WILKINSON said that the liver principle necessary for the production of normal red cells was absent in pernicious anaemia and a similar, if not the same, principle was obtainable from animal livers. During the last twenty years many species of animals had been examined, and livers containing this active principle were found to be widely distributed in the animal world. It was noteworthy that whale liver and cod-liver residues, after the oil had been removed, were inactive. The same was true of fish livers in general, and he had yet to obtain an active liver extract from reptiles. An important observation was that the livers of cattle that had died of diseases such as nakuruitis did not contain the active liver principle. It had been for some time a matter of concern that post-war liver extracts had not the same haematopoietic potency as those available before the war. The present starting materials for these were "pharmaceutical livers" that had been rejected as unfit for food owing to disease conditions such as cysts, tubercle, fibrosis, or cirrhotic processes, and it might be that half the livers were of no value pharmaceutically; the increased total inert solids in these liver extracts were likely to cause reactions and pain when given to patients. A certain amount of edible fresh liver might well be diverted for pharmaceutical purposes. Hog stomach preparations were in the same position. The material fetched a higher price in the food market and appeared as pork pies and sausages when more of it ought to appear in the form of pharmaceutical preparations.

Dr. Wilkinson gave some comparisons showing the response in the same or similar cases on the same therapy using comparable liver preparations in 1939 and in 1945, and the lowering of the response in the latter period was evident. He also pointed out that the more chemical processes through which these liver extracts were put the greater was the risk of finishing with a sub-potent preparation. Recently there had appeared in the literature reports of anaemias said to be refractory to highly purified liver preparations. If the original preparation had not been tested—that is to say, the individual batch—it should not be said that the case was refractory, for it might well be that the preparation had not been tested at the time and that it was an inactive batch which was being used. His advice was that if a patient did not respond within a fortnight to a liver preparation the preparation should be changed. The period of trial should not be extended, and it should not be said without investigation of the material that it was the case which was refractory.

Turning to folic acid, Dr. Wilkinson said that in 20 cases under his own observation folic acid had not prevented the development of neurological lesions in 9, and in 184 cases reported in the literature 60 had developed neurological lesions. These neurological lesions might come on within a month of starting treatment. Folic acid did not maintain the majority of cases of pernicious anaemia in normal health. There was a gradual falling off in the blood count. The effective dose was large in comparison with liver, and it did not relieve the neurological symptoms.

As for prognosis in pernicious anaemia, Dr. Wilkinson gave some figures of comparable cases before and after liver treatment was introduced. In 68 cases before the advent of liver therapy the average duration of life was shown to be six months; all but one of the patients died within nineteen months. In his group of patients 1,480 received liver or stomach treatment during the last nineteen years and only 301 were dead, while of these 105 had lived for five years and 149 for 5–20 years. Of those alive, 1,032 had been under treatment for more than five years. One of the survivors was over 100 years of age; seven were over 90; 99 were over 80, and 400 were over 70. If patients with pernicious anaemia were treated properly and adequately with preparations of liver or stomach they would get and remain well.

Further Discussion

Dr. J. V. DACIE presented some work, illustrated by photomicrographs, showing the diversities of the bone marrow picture in megalocytic anaemias. He said that although the megaloblastic change was often extremely characteristic and easy to recognize, in certain circumstances all shades of change might be seen from strictly normoblastic to well marked megaloblastic erythropoiesis. His general thesis was that megaloblastic dysplasia was a type of change due to lack of an essential haematopoietic substance or substances, and that all grades of such deficiency were paralleled and illustrated by the type of nucleated red cells in the marrow, varying from typical megaloblasts to cells hardly recognizable as normoblasts.

Dr. BODLEY SCOTT raised a point of nomenclature. The term "megalocytic anaemia" did not define the group about which the openers had spoken. It was better to speak of "megaloblastic anaemia." In some megaloblastic anaemias there was no megalocytosis. A great deal had been said about megaloblasts of various kinds. He had always felt that although there was a lot of argument about the individual megaloblast nobody discussed what was megaloblastic hyperplasia. The megaloblast had been defined as a normoblast which was suffering from a nutritional deficiency. He had hoped to hear in the discussion a little about the intimate causation of these anaemias, but previous speakers had skated delicately around that subject.

Dr. JOHN MILLS said that the fact that an extract was potent with a patient in relapse was no indication that it would maintain the patient for a long period. He gave examples showing how a refined extract gave a poor showing against a crude extract. One was constantly coming upon patients treated by refined extracts who were in relapse and their doctor did not know why. His argument was that the ordinary testing of liver with the patient in relapse was unreliable. The liver must be subjected to a long-term test to see whether it maintained the patient as well as pulling him out of a relapse. Dr. SIBALDGEN mentioned some work on methods of cell counting and estimation of cell size.

Correspondence

Changing Practices in N.H.S.

SIR,—The remark in the *Observer* of March 21—"It is impossible to believe that a truce will not be called"—must express the feelings of many who, like me, have for personal reasons great sympathy with the ideals of the Labour Party. That party's attitude should be easily comprehensible to medical men who remember that its members are drawn from the lower and lower middle classes, who have been influenced for five generations by the psychological and material environment of our industrial areas. But these members are essentially British, and I cannot believe that a reasonable attitude will in the last resort be wasted on them.

On the other hand, I have great sympathy with the feelings of Dr. Lindsey W. Batten (March 20, p. 561), who raises one of my own great anxieties regarding the future. It has seemed to me that men who suffer loss although they enter the Service should be compensated by some form of priority in transfer to other practices, should they desire. In general, also, it has seemed that all medical men should have freedom to move about within the Service. These points I have put to Mr. Somerville Hastings. He has consulted with the Minister, who replied in the following letter, which I received on the morning of the Special Representative Meeting.—I am, etc.,

Hove, Sussex. W. A. BOURNE.

Dear Somerville,

You wrote to me on March 3 about doctors who want to change their area of practice. We do not contemplate that it should be any more difficult to change under the new scheme than it is at present, and we shall do our best to ensure that no unnecessary obstacles are put in the way of reasonable changes. Vacancies will, of course, continue to arise owing to the retirement of the older doctors and we contemplate that in the normal way these vacancies will be advertised. It will be open to any doctor wishing to change his area to watch advertisements of vacancies in the area to which he wants to go or to apply for them. If he is selected to succeed to an established practice he would, of course, also succeed to the income straight away. If he sets up to create a new practice in an under-doctored area the fixed annual payment which is to form part of his remuneration will help him over the initial difficulties.

I think it would also be possible, if he could find another doctor willing to exchange practices with him, for the doctors to apply,

through the Executive Councils, for the consent of the Medical Practices Committee to each taking up practice in the place where the other lived. The consent of the Committee could not be dispensed with, but no doubt they would deal as sympathetically as possible with applications of this kind.

Yours sincerely,

ANEURIN BEVAN.

Locke on Power

SIR,—There can be little doubt that Locke[1] would have approved of the object of the N.H.S Act, because he laid down that the end of a civilized society should be the common good; and he defined the latter as the protection of the life, health, liberty, and possessions of the individual citizen. In his view these objects could only be achieved by laws drawn up at the consent of the people through their Parliamentary representatives. He insisted on the supremacy of the law and on the separation of the legislative from the executive as a necessary protection of the common good. The liberty of the individual in society was for Locke the freedom from the absolute arbitrary power of other men, the only way of obtaining this being that men should agree to live by a set of standing rules set up by their elected representatives and common to every member of the society. These rules were to be the sole tools of the executive and to be administered by authorized judges. By contrast Locke defined licence as the state of affairs when the citizen is subject "to the inconstant, uncertain, unknown, arbitrary will of another man." I would suggest, therefore, that Locke would have given a definite answer upon the amount of arbitrary power which the Act has put into the hands of the Minister. He discusses the whole problem under the heading of Prerogative.

Prerogative he defined as the power of the executive to act for the public good without the detailed prescription of legislation. Locke admitted that this was necessary because "the legislatures not being able to foresee and provide by laws for all that may be useful to the community" had to allow the executive some freedom of action. Moreover, he states that the legislature may act too slowly for the dispatch requisite to meet certain "accidents and necessities," and that too strict and rigid an observation of the laws may sometimes be harmful. Locke, however, gives a stern warning upon the subject of prerogative. In the hands of a good magistrate prerogative is often a means of doing good, but bad magistrates, the successors of good ones, are apt to claim the prerogative entrusted to their illustrious predecessors as belonging to them by right of office, and tend to resist the attempts of the citizens to recover this arbitrary power. Locke points out, therefore, that good magistrates have always been the most dangerous to the liberties of the people. Finally he discusses the question of who is to be judge of when the arbitrary power of prerogative has been abused or not. He asserts that when an executive power in being holds such a prerogative there can be no judge on earth, and he ends with the following words, "The people have no other remedy in this, as in other cases where they have no judge on earth, but to appeal to heaven."

Locke does not, however, leave this dilemma unsolved. He makes it quite clear that when the trust implicit in prerogative has been abused, the people, as the donors of that trust, have the right to recover it by the use of force. It would appear, therefore, that in all probability Locke would consider the employment of a strike as morally justifiable and necessary in practice to correct the abuse of prerogative if all else failed.

The future may show that the abuse of arbitrary power can only be checked through the acceptance of the individual of the membership of an organized group such as an Association or Trade Union, which can oppose force by force.—I am, etc.,

Manchester. F. S. A. DORAN.

REFERENCE

1 *The Second Treatise of Civil Government.* Edited by J. W. Gough. Oxford: Blackwell, 1946.

Reflections on the S.R.M.

SIR,—What can we do to muzzle the "wind-bags" of our profession? After the comprehensive and statesmanlike speeches of Dr. Dain and Lord Horder at the Representative Meeting there was little more to be said, but valuable time was wasted by some with speeches in their pockets which they were determined to deliver. Our principles, which we have all known for years, were reiterated *ad nauseam*. To flog a dead horse is a waste of time and energy, to flog a winning horse is only to risk killing it before it reaches the winning-post. If a representative has a point of view which has not been put forward, it is his democratic right and duty to express it, but if it has been said already he should ask himself, "Is my speech really necessary?" As a result of the wasted time there was the usual frantic rush at the end, as representatives with eyes on the clock withdrew motions or referred them to various bodies. If a dictator ever tries to rule the Representative Body his tactics will be obvious—relegate all important business to the end of the Agenda.

When the B.M.A. solicitor advised us on certain courses of action I thought I understood him. When later, in open session, such matters as refusal of certificates were discussed, I began to doubt if I had appreciated the distinction between various problems referred to an outside body and those within the province of the Representative Body. I was amazed at the way Dr. Dain and Dr. Gregg denounced Dr. Cockshut's advocacy of refusal of certain certificates as a form of resistance. Surely they were talking sentimental nonsense when they said we must never do anything to hurt our patients. We hurt our patients every day of our lives if we are good doctors. If we open an abscess, even with an anaesthetic, we hurt them. If we tell them they are drinking themselves to death we hurt their feelings. Surely the test is whether we hurt them cruelly or negligently, or whether we hurt to heal. We believe we are fighting to save our patients from the "hurt" of totalitarianism. Any reasonable measure to bring them to their senses is therefore justified. If we are to give them all the attendance they need, charge no fee lest we hurt them, give them medicine lest the chemists hurt them, and supply certificates in case they suffer any inconvenience, how is the "brief period of chaos" to be effected which is to force the Government to reason? The patients will be indifferent; the Government will be overjoyed, as they will have the Service without obligation to pay for it; and only the doctors will be hurt.

One last word. The trustees are excellent men who command the confidence of the profession, but they are responsible to nobody. We are proud that the Webbs testified to the Fabian Society that the B.M.A. is the most democratic professional organization in the world. Circumstances have apparently forced us into undemocratic action, giving almost unlimited power to a body outwith our control, like the Minister of Health under the Act. I suppose we must sanction this, but let us do so with watchful determination that it is "only this once."—I am, etc.,

Lairgate, Beverley. PETER C. MCKINLAY.

Doctors or Ants?

SIR,—Are doctors to be converted into intelligent ants? The analogy seems instructive.

I have had cause to enquire into the emotions of worker ants, which are not complicated by sex. Their intelligence is amazing, but their emotions, apart from rage in battle, seem very few. They are joyless automata. The State is the individual, not the ant. Some ants can enjoy leisure and play games, but they rarely do so.

Some workers are blind or nearly so; thus they are less distracted from their work and regimented more easily. On the march, workers may be regimented by large-clawed policemen or small officers; mostly they have learnt to regiment themselves. A few gardening ants were placed in a "garden" too big for them. They rushed about their work without stopping to eat till they dropped down dead. This is not noble but a dreadful result of a sociology evolved for State-efficiency alone.

Our own conduct is guided by inherited feelings of what is pleasant or unpleasant, moderated by what public opinion considers good. This makes happiness a possible goal and provides choice, even if illusive. All this is denied to the ant: he seems free, but is the slave-automaton of the State.

Man is unique because he alone can accumulate knowledge whereby he can, if he will, control his own evolution and progress. The communism of ants is the product of lay evolution: ages ago it reached perfection of its sort; it cannot progress further (J. Huxley). But how joyless and cruel is this perfection! No wonder doctors instinctively abhor regimentation by the State, however perfect.—I am, etc.,

Beverley. FRANK C. EVE.

Tell the Public

SIR,—For over twenty years I have been—or tried to be—a loyal member of the profession and of the B.M.A., and as such I replied to the plebiscite. Now is the time for second thoughts and in following the lead of our Association to say, "Quo vadis?"

I for one—and there may be many—had hoped that by this time some more positive (or even polemic) policy would have been adopted by our chosen negotiators: and I cannot agree with the premise in your leading article "Towards a Decision" (March 20, p. 550) that because 40,000 doctors have voted against the Act they have *ipso facto* expressed confidence in the policy at present followed by the representatives. I see no profit or professional dignity in acting the part of one molecule in the immovable mass when confronted by the irresistible force. I am no physicist and dare not publicly press this analogy; rather would I change the metaphor and invoke the catalyst of Public Opinion to effect the solution of incompatibles.

Where is our P.R.O.—and what is he doing to help us to convince our patients that we are, in part at least, fighting their battle for them? As far as I am able to judge, most of his efforts have been expended on sending pamphlets to the profession. Ignorance breeds fear, or dislike, in the minds of the uneducated; and because of ignorance we have failed to secure the whole-hearted support of the public in the presentation of our case. If it were possible to insert in some popular "Quiz" programme the question, "What is the B.M.A. and what does it stand for?" three out of every four answers would be either, "The Doctors' Trade Union," or "Something to do with the G.M.C.," or anything but the truth.

Can we not in the short time which remains to us make every possible endeavour to enlist public opinion on our side? The man in the street is heartily sick of the—to him—abracadabra of professional ethics, and this discussion anent the buying and selling of practices gives him a pain in the neck. The first thing he wants to know is, "Will I be able, under the N.H.S., to have my own doctor?" and the second, "What am I going to have to pay, and to whom, and what shall I get for it?" And if the answers do not satisfy him to whom but the B.M.A. is he to look for succour? Not to the politicians. I urge our leaders to descend from the heights of Olympus in Tavistock Square to give light to the patients who sit in darkness, and confidence to the isolated practitioner who sits and wonders—if not wavers—in his surgery. In the anxious days which lie before us it seems that unless some *deus ex machina* intervenes we shall be "advised" to give, like strolling players, our little (clinical) piece, and then send round the cap for such contributions as our patients may be inclined or—after rendering to Bevan that which is Bevan's—able to deposit therein. Capitation might be preferable to the cap of martyrdom.—I am, etc.,

Worthing, Sussex. A. G. EDDISON.

Party Politics

SIR,—I have been one of the readers of the *Journal* now for some 30 years, reading it, I admit, with varying degrees of attention and, yes—*horribile dictu*—occasionally not opening it at all, but I was unaware that it had taken part in a definite public line-up on party politics and was now an anti-Labour-Party periodical. In proof of the *Journal's* public attitude in party politics let me quote you, not from the correspondence columns of the *Journal*, for the opinions expressed in which, quite rightly, the Editor does not hold himself responsible, but from your own leading article in the issue of Feb. 21 (p. 347): "Behind this opposition" (to the new Act) "we see apprehension at the increasing regimentation of all sections of the community, and a reaction against the dislike and envy of the educated classes shown by the rank-and-file of the present Labour Government, eager to disenfranchise the university voter."

Apart from my humble opinion that the result of the plebiscite shows that doctors as a whole have no claim to belong to the *politically* educated classes, it is amazing to see that your editorial has failed to grasp the whole aim of the franchise Bill, which is to abolish *all* plural voting and for the first time in this country of former "freedoms" to ensure the "one man one vote" principle. The Bill in no way shows enmity to the university voter nor to the possessor of a shop in a different borough, but merely to the possession of a dual vote, and would have been just as insistent if this double privilege had been held by the theatrical profession or by the Society of Ice-Cream Vendors. I had no idea either until reading this leader in your *Journal* that the Socialist classes did not contain an increasingly large number of the "educated" classes, including many of those with the best brains.

Lest it be thought that I have jumped rashly to conclusions about the politics behind the *Journal*, let me quote from the same issue, and from your second leader (p. 348). "The uncomfortable new England taking shape under our eyes"—a declaration to any student of politics against the whole policy of extensive nationalization, a declaration which not merely declares war against the Labour Party but at the same time runs up the Tory colours to the top of the mast. Could this bias have had anything to do with the advice given to every doctor as to how to vote in the present plebiscite?—I am, etc.,

London, S.E.27. P. G. S. DAVIS.

Solution to Impasse

SIR,—I advocated nationalization of the hospitals many years ago. I am convinced that human society tends towards collectivism. I abhor the panel system advocated by the B.M.A. Withal I dread the 5th of July. There is something radically wrong with the Health Act: far too much power is vested in the central authority, the Ministry of Health. It means control by officials. Influence and intrigue will be vital factors in the business transactions of the new service, and there will be no place in it for the pioneer or the self-respecting doctor. The Act offers no basis for a compromise and completely ignores the vital need for hospital organization on scientific lines. The majority of medical men will not part with their freedom lightly, and no matter what concessions may be offered the result of a second plebiscite will still show a majority against the Act. At the same time it would not be fair to the public to postpone the appointed day. I suggest a simple solution of the problem.

Everything should remain as at present. The Government should simply take responsibility for payment of doctors' bills on the basis of standardized fees for consultations and visits. The patients should please themselves which doctor they like to consult, and the doctor should please himself which patient he likes to treat. The medical men should be under no control of any Government department, and should not even enter into any contract with the Minister of Health. The hospital doctors should be paid by the hospital committees, either by sessions or by single consultation. There must be some machinery to prevent abuses, and there would be no reason at all why the Minister of Health should not appoint some full-time men for districts in which the doctor population is sparse, or even some full-time men in hospitals. The public would approve such an arrangement, and so of course would the doctors. The experiment should last in the first instance, say, for two years.—I am, etc.,

Liverpool. I. HARRIS.

The Independence Fund

SIR,—As soon as the appeal arrived yesterday morning I filled in the form and enclosed a cheque for £100. I could not do otherwise when I remembered Nuremberg. To what depths of infamy had the German medical profession fallen from the highest respectability. Berlin and Vienna had been the Mecca for all branches of the profession in all parts of the world. Who goes there now? Culture and technique were at their highest till the State took control.

No doubt the same assurances were given to the doctors in Germany by the National State Socialists as are being given to us. To have proposed to professors in Berlin that such things as were revealed at the recent trials would happen under the hands of their élite would have caused offence. One would have been treated with scorn and contempt. They were as sure that they could not happen as those of us who favour State control here. We have been warned by this revelation and have no excuse. Many of our men have suffered wounds and death to remove that form of Socialism which ends in corruption and

slavery. Some of the present Ministers lost nothing in that cause. Ought not the public to be reminded of Nuremberg? It is because of fear of this degradation if we surrender our liberty to the State under the authority of Ministers as devoid of culture as those who held sway in the Germany of the recent past that I hasten to support the Independence Fund. It happened in Germany and we have been warned.—I am, etc.,

Bolton. W. HARVEY BENNETT.

A Public Meeting

SIR,—In view of the importance of getting public opinion to our side the following experience may be of interest. Without any outside support I hired a hall and advertised a public meeting. I was told I would probably get 50 or 60 people. To my amazement 500 crammed into the hall and 200 were said to have been turned away.

I spoke for 50 minutes and then asked for questions. Not only did I receive no heckling, but as response to a suggestion I made in reply to a question a local committee has been formed to organize a petition to be sent to our M.P. pledging support to the doctors and giving the opinion that the Health Act as it now stands can lead only to a deterioration of the standard of medical treatment.

The population of the town is 4,000 and the constituency returns a Labour M.P., but I believe the town itself to be Right Wing in its sympathies. Our trade unionist has since said to me, "If you could tell the workers all you told us last night they would be with you to a man."

I would emphasize two things. The meeting was organized without the outside aid of any organization, which gave it a non-political flavour. I feel addressing Conservative, Liberal, or Labour meetings tends to divide the public into hostile groups. Secondly, the advertising emphasized the effect of the Act on the patient—not the doctor.—I am, etc.,

Newport Pagnell, Bucks. A. A. CLAY.

Partial Service

SIR,—In the first leader of *The Times* of Feb. 17 I read the following astonishing statement:

"Existing public medical services originated either in the Poor Law or in insurance schemes and were intended to provide elementary and partial forms of medical care for a restricted section of the community. . . . These services were regarded not as the normal means of obtaining medical care, but as services for those who could afford nothing better, and doctors were prepared to tolerate this unhappy tradition because the private sector in medicine remained financially more important than the public sector."

That a writer in so important and distinguished a paper as *The Times* could express such views is a measure of the gulf separating the views of the medical profession from those of at least a very large section of the public. I wrote to *The Times* protesting that while a minority of doctors may have felt themselves forced by the conditions of the service to adopt such an attitude the majority had only one standard of treatment for rich and poor alike—namely, the best the doctor was capable of.

I feel that it is because they fear that a State medical service under the almost dictatorial control of the Minister of Health may drive many doctors to accept and adopt this partial form of medical treatment rather than infringement of the B.M.A.'s basic principles that has led so many doctors to oppose the present unamended Act.—I am, etc.,

London, W.8. H. H. SANGUINETTI.

Immediate Action Wanted

SIR,—Mr. Bevan's war of nerves has already opened against the medical profession. Patients are to be issued with their Health Service cards this month.

I feel, and I think from reading articles in the *B.M.J.* that other doctors feel too, that some immediate and firm action by the doctors is required now instead of waiting until July 5, after which doctors will lose the compensation for their practices. Even if this action only consisted in a general refusal of doctors to sign any form of certificate from now on, except those which they are bound to sign by contract, such as National Health Insurance certificates, and others such as milk certificates, which are necessary for their patients' health.

Resistance to unwanted conditions by any other bodies of people, such as coal miners, would be along these lines, whereas passive resistance will, I think, only lead to the profession being eaten up piecemeal.—I am, etc.,

Colchester. R. H. BERRY.

Human Poliomyelitis and Canine Encephalitis

SIR,—During the past year this country has had the most severe epidemic of acute anterior poliomyelitis on record. During the same period there appears to have been a great increase in the number of cases of encephalitis in dogs. Because of the time association between the human and canine illness, there have been communications from a number of quarters in the medical, veterinary, and lay press suggesting that the canine disease was the result of infection with this season's strain of poliomyelitis virus.

Recent investigations by MacIntyre, Trevan, and Montgomerie (*Veterinary Record*, 1948, **60**, 102) have shown that a disease of dogs, comparatively new to this country, was prevalent at this time. While it simulates true distemper in some of its symptoms, encephalitis occurred in a high proportion of cases. In none of these cases was the histological picture similar to that of human poliomyelitis. There seems little doubt but that the prevalence of this disease in dogs at the same time as the poliomyelitis outbreak was no more than a coincidence.

Attempts to infect dogs with poliomyelitis virus in other countries have regularly been unsuccessful. Even so, it seemed worth while repeating these experiments using a strain of virus obtained from the recent epidemic. The dogs used were of mixed breed, all under one year old, and all were immune to distemper virus.

In the first experiment three dogs were inoculated intracerebrally under "nembutal" anaesthesia with 0.1 ml. of a 10% suspension of first passage poliomyelitis monkey cord. The monkey had been inoculated with brain and cord of a fatal human case in this year's epidemic, and the material used for the dogs was proved to be infective at the time by passage into a further monkey. The dogs showed no elevation of temperature, or symptoms and signs of any kind. One was killed after 14 days and two after 21 days. The brains and cords were removed, and after representative sections had been taken for histological examination pieces of brain and cord were pooled, ground as a 20% suspension, and cultured. The tissues from each dog were ground separately. The small number of bacteria present were removed by centrifugation at 3,000 r.p.m. for half an hour in an angle centrifuge. The suspensions were pooled and inoculated intracerebrally into five more dogs. These remained completely well; two were killed after 22 days, and a third passage made of these brains, reinforced with more monkey tissue, into four more dogs. These animals remained perfectly well, and one was killed after 35 days for histological examination. The remaining three have remained well up to the 40th day. No abnormalities could be detected on microscopic examination of the brains. Tests for neutralizing antibodies have not yet been carried out in inoculated dogs.

Thus, distemper-immune dogs do not appear to be susceptible to one of the 1947 English strains of human poliomyelitis virus.—I am, etc.,

Virus Reference Laboratory,
Central Public Health Laboratory,
London, N.W.9. F. O. MACCALLUM.

Scepsis Scientifica

SIR,—Dr. A. McPherson's thoughtful letter (March 20, p. 567) calls for a few words in reply. I did not mean that a science that could be expressed wholly or largely in mathematical terms was therefore a better science, merely that its pursuants have been more fortunate than we. I agree cordially that it would be absurd to expect that all biological processes could be completely or even properly expressed in terms of measurement. We shall, however, not be wrong in applying them where we can nor shall we retard progress by doing so. It is probably true that too great an insistence on exact definition in the most precise terms is better fitted for the aftermath of discovery, for discovery itself has often had little to do with rigid definition

of the minutiae beforehand. That is so of all the sciences, even of mathematics.

Finally, I did not say that Trotter was a greater man than Francis Bacon, who had in fact anticipated many of his views. The art of tight and lucid compression of thinking was unknown in Bacon's day. And, for me at least, his lovely patches of illuminating thought are imbedded in vast expanses of tedious and repetitive writing. It was Baudelaire who said in a letter to Fraisse on Feb. 2, 1860, that long poems were written by those who had not the talent to compose short ones. How true that is.—I am, etc.,

Manchester. GEOFFREY JEFFERSON.

Rectal and Vaginal Temperatures

SIR,—Dr. Mary Barton (March 20, p. 567) advocates recording rectal as opposed to oral temperatures for the determination of ovulation and the assessment of ovarian activity. Half her patients prefer the rectal method to the oral because they are afraid of biting the thermometer in half if they put it in the mouth. As the result of our experience we have adopted the oral method because our patients find the rectal method distasteful and because we believe the vaginal method to be dangerous. (One of my patients had a portion of the thermometer surgically removed from the bladder, having been instructed to take her temperature per vaginam by the gynaecologist whom she consulted before coming to me.)

All who have studied the subject agree that the basal temperature pattern has considerable significance. What everyone now wants to know is, (1) Does the basal temperature pattern denote whether ovulation has taken place? (2) Can it indicate exactly when ovulation takes place? (3) What information does it provide as to the degree of ovarian activity? (4) Is it likely to give more accurate information if the temperature is recorded rectally than if it is taken by mouth?

1. Our experience at the Fertility and Endocrine Clinics of the Chelsea Hospital for Women has been that if a typical biphasic temperature pattern is obtained (i.e., temperatures recorded as being relatively lower in the pre-ovular than in the post-ovular phase) ovulation in that cycle may reasonably be assumed. In the absence of this typical biphasic pattern we would not feel justified in presuming that ovulation had not taken place without the evidence provided by an endometrial biopsy on the first day of the bleeding which terminated that particular cycle.

2. We would hesitate in the majority of cycles with a biphasic temperature pattern to fix the date of ovulation within 3 or 4 days of the "ovular dip" or subsequent rise in temperature.

3. We would hesitate to express an opinion on the degree of ovarian activity, other than in typical ovular cycles, on our analysis of the temperature records.

4. It is our impression that oral temperatures are just as likely to produce the typical ovular biphasic pattern as rectal temperature records.

In other words we believe that the only significant finding is the typical biphasic pattern which indicates that ovulation has taken place in that particular cycle, and that we obtain that record even though the temperature is taken by mouth.

Here we obviously disagree with Dr. Barton, who claims much more for basal temperature recording. How can our differences be settled? Clearly only by a careful analysis of a statistically adequate number of cycles, and an observation of a series of cycles in which simultaneous oral and rectal temperatures have been taken.

We have been recording basal temperatures fairly conscientiously in a number of our patients over a period of about three years. We probably have records of about 500 cycles. Dr. Barton, however, has "during the past five years been using temperature readings whenever possible in thousands of cycles" (March 20, p. 567), and has "collected temperature records in several hundred women during the past seven years" (Barton, M., and Wiesner, B. P., *Lancet*, 1945, 2, 663). If this is the case she is obviously in possession of data which should be capable of answering these four questions beyond statistical doubt. It is therefore unfortunate that "for reasons of space, neither complete presentation of data nor their statistical evaluation" could be attempted in her 1945 *Lancet* paper, and that her recent communication in the *Journal* was an item of correspondence necessarily short and dogmatic. Despite the fact that her *Lancet* article occupies 5½ pages—a very generous allowance of space in 1945—she does not give one single definite figure concerning the number of cases in the various groups she discusses. She resorts instead to such statements as "in our series of observed pregnancies (numbering about 150, and including nearly 90 cases recorded for two months or longer after conception). . . ."

In view of the very important potential significance of temperature records in relation to ovulation and ovarian function I believe the time has come for Dr. Barton with her unique experience of this method to make a scientific contribution to the elucidation of this problem rather than contenting herself with dogmatic generalizations which, though interesting, can hardly claim the authority which she obviously should be in a position to command.—I am, etc.,

London, W.1. P. M. F. BISHOP.

The Pain of Labour

SIR,—It has recently been stated in your correspondence columns and elsewhere that uterine contractions of the first stage of labour "should be painless." Whether or not this be true is perhaps a matter for philosophical and theological argument rather than a basis for obstetric practice. The solid fact remains that the great majority of women who have passed through this experience agree that it is attended by a varying amount of pain whose characteristics and distribution are more or less uniform.

Deep pain, whether arising from a viscus or other structure, is felt in more superficial structures of the same sclerotome.[1] While the female genital tract, like other visceral structures, shows no evidence of segmentation, its nerve supply is necessarily derived from the segments through which it passes. The upper end of the tract, formed from the Müllerian ducts, begins in the embryo at the level of the eleventh thoracic to second lumbar segments, from which it receives its nerve supply. The vagina and perhaps the cervical part of the uterus are probably developed as an up-growth from the urogenital sinus, and are innervated from the pelvic nerves (S2–S4). It would appear that the intervening segmental nerves (L3–S1) take no part in supplying these organs, being devoted to the formation of the great plexuses to the lower limb.[2,3] The sites at which labour pain is felt might be accurately predicted from these considerations. It occurs in the upper lumbar and lower sacral sclerotomes without radiation into the areas served by L4–S2. It is admitted that the uterus can be cut or burnt, the cervix cauterized, pierced, or grasped with vulsellum forceps, and no pain results, but similar insults can be equally painlessly inflicted upon other abdominal viscera from which spontaneous pain is known to arise.[4] In each case only the "appropriate stimulus" induces pain. For the cervix such stimulus is stretching; for the uterine body it may be ischaemia.

Meigs[5] found that even after resection of the superior hypogastric plexus pain can be produced in the lower sacral areas by cervical dilatation. It is during the last two-fifths of the first stage that sacral pain is most intense.[6] During pregnancy, on abdominal palpation uterine contractions are frequently noted, but these are never sustained or intense. When labour has begun the pain is not noticed at the same time as contraction begins but follows 10–20 seconds later, reaches its acme, then rapidly fades a few seconds after the uterus has relaxed. The tortuous course of the intrauterine vessels must render them particularly liable to obliteration by myometrial contraction. These observations, and considerations of the effects of muscle ischaemia elsewhere,[4] suggest that this is the "appropriate stimulus."

Of all sensations pain is the most susceptible to modification.[7] It is a perception subject to influence by cortical control, associated impulses and ideas, and the emotional state. Discriminating sensations normally exert an inhibiting effect on impulses subserving pain, so that unless these impulses are so strong as to dominate the entire sensory pattern, pain as such may not register in consciousness. The state of the sensorium at any particular moment is the product of all stimuli being experienced. Further, pain may be much modified or even abolished by suggestion. It is therefore apparent that the degree to which pain is perceived during labour may be modified by a number of variable factors—the emotional pattern, the degree of confidence reposed in medical attendants, and the amount of healthy interest taken in the physiological experience through which the mother is passing. This last may dominate the sensorium so completely that little pain is noted.

With the onset of the second stage of labour marked change is often apparent. Cervical distension is replaced by vaginal and perineal stretching as a cause of pain, but, the woman's attention now being directed to purposive activity, such pain may be felt

less severely. Clearly muscular tenseness from anxiety or any other cause will augment pain.[6]

From the foregoing it is contended that pain felt in labour is a physiological response to uterine ischaemia, cervical dilatation, and stretching of the passages. As in pain from other sources, perception may be modified by the emotional state, which is doubly important in that it may influence actual uterine functioning. While therefore certain obstetricians are able to conduct relatively painless childbirth without anaesthesia, this is a tribute to their enthusiasm, personality, skill, and zeal rather than a proof that childbirth is "normally" free from pain. The great majority of parturient women will continue to require some form of analgesia, local or general, and no vague philosophical concepts should be allowed to interfere with progress in this direction.—I am, etc.,

London, W.2. J. DONALDSON CRAIG.

REFERENCES

1 Kellgren, J. H., and Lewis, T., *Clin. Sci.*, 1939, **4**, 47.
2 Hamilton, W. J., Boyd, J. D., and Mossman, H. W., *Human Embryology*, 1945. Cambridge.
3 White, J. C., *Proc. Ass. Res. nerv. ment. Dis.*, 1943, **23**, 384.
4 Lewis, T., *Pain*, 1942. New York.
5 Meigs, J. V., *Surg. Gynec. Obstet.*, 1939, **68**, 723.
6 Read, G. D., in *Antenatal and Post Natal Care*, by F. J. Browne, 1946. London.
7 Wolff, H. G., and Goodell, B. S., *Proc. Ass. Res. nerv. ment. Dis.*, 1943, **23**, 434.

Harrison's Grooves

SIR,—The article by Drs. J. Naish and H. R. E. Wallis (March 20, p. 541) dealing with the above subject and its possible aetiology prompts me to ask if the cause of the condition is primarily in the chest at all; if the chest condition may not be secondary to the abdominal distension from infantile hearty feeding; and if the repeated abdominal distension might not be alone sufficient to account for, on a purely mechanical basis, the ultimate production of the grooves.

The abdominal distension that can occur as a natural and normal phenomenon after a feed in a healthy baby has to be seen to be fully appreciated. The following points should be considered: the frequency of the feeds; their repetition several times daily for months; the fact that the feeds are most often given with the baby in a sitting or a semi-sitting position; that, at least in the early months and towards the completion of the feed and even without the baby being in the constrained position previously mentioned, the lower ribs can actually be seen splaying out as if to allow the upper abdomen to accommodate the increased abdominal contents with the production of temporary grooves (or the makings of them); and that, fed in the position mentioned, the breathing of the baby can sometimes be seen to become temporarily embarrassed even to the point of becoming noisy—the accessory respiratory muscles coming into play—and perhaps the face red.

I had the opportunity over a lengthy period some time ago of closely and repeatedly observing the feeding of a baby from two weeks after its birth. Its parents were of the professional classes and there was no question of any dietary, vitamin, or other deficiency. The health of the child was excellent. I repeatedly observed the phenomena already described without at the time appreciating their significance, and the Harrison's grooves became permanent. There was no ascertainable cause for the production of the grooves other than the repeated post-prandial distended stomach.

Also, as would appear in most cases, at least judging from what one was taught and what one can read in textbooks, the onset of the condition is so insidious that it escapes the eye of the fond mother, who consequently never brings it to the clinic for that reason alone. In the case cited the condition though relatively slight was present as a permanency before I was aware of the fact that it had actually become so.

The association of the condition in other children with chronic respiratory affections such as asthma and diminished lung expansion in post-pneumonic states could conceivably be explained on the same hypothesis—or at least it would act as a large contributing factor. For feeding to the baby, as well as having a hunger-satisfying aim, has also the very important psychological function of allaying any anxiety experienced by the child. A child will feed, if circumstances are favourable to feeding, not only because it feels hungry but also at times because it feels anxious—i.e., it will drink its food in certain (psychological) circumstances when there is no (physical) necessity for it doing so—and any chronic respiratory affection, such as asthma, does have much associated anxiety. Thus the extra feeding such a child will take, if given it, in an endeavour to allay the anxiety felt will also accentuate the abdominal distension with outward movement of the lower ribs and with upward pressure on the lungs which are physically abnormal.

To attempt to generalize from one case is very rash, and the foregoing hypothesis—the insidious development from a naturally occurring cause repeatedly acting in a mechanical manner over a lengthy period—is merely thrown out as a passing suggestion for a possible line of investigation to one with sufficient interest, time, mechanical knowledge, and *x*-ray facilities.

But the hypothesis, tentative though it is, seems to fit without undue stretching most of the facts—such as, to mention a few, its occurrence in children who are otherwise physically normal and who have enjoyed good previous health, Naish and Wallis's finding that 77% of their unilateral cases in the control group were left-sided, and the same authors' reference to Jenner's observation that the grooves are level with the upper surfaces of the liver, spleen, and stomach—and would seriously have to be reckoned with before being disposed of as invalid. Individual variations in different babies in the way of *volume* of amounts taken at each feed in proportion to the body volume, the frequency of the feeding, constitutional factors in the way of bony, cartilaginous, and relative muscle strengths and their interacting and relative preponderances, accidental catastrophic factors of lung affections (such as asthma), and infections (such as pneumonic and post-pneumonic) with diminished lung expansion—all these would, of course, also signify, especially since the normal biological capacities of the alimentary system are not primarily affected in these conditions.—I am, etc.,

Shotts, Lanarkshire. R. GOOD.

Where Are We Going?

SIR,—There must be many of the older clinicians who have been thinking on the lines of Dr. Ffrangcon Roberts's excellent article (March 13, p. 485) and deploring the present state of medicine as he does. As with a disease—and it is a disease of modern medical practice—it is as well to consider the main aetiological causes.

To my mind there is a predisposing cause and an exciting cause. The former is the present method of medical education, whereby the more intelligent entry to our profession passes his school certificate at the age of 14, and hereafter devotes the rest of his education to science—an excellent training for a laboratory boy but a very poor one for clinical work, which, as we all know, is a very inexact science demanding close observation and deductive reasoning. The exciting cause is that most of the younger members of the hospital staffs have served as specialists in the Services. The medical branches of the Services are administered by a class many of whom got where they are by their extreme adroitness at "covering themselves." As Dr. Roberts points out, so many of these investigations ordered are not for the benefit of the patient but are used as a method of covering the clinician. So the administrators of the Services by orders and regulations have tied the hands of the specialists to such an extent that what clinical acumen they possessed has been wasted and allowed to die away.

If and when the State Medical Service starts I cannot see the administrators altering their outlook, an important point so far overlooked.—I am, etc.,

Bristol. RICHARD C. CLARKE.

Bone Conduction in Otosclerosis

SIR,—In two recent numbers of the *Journal* letters have appeared regarding this subject, from which diametrically opposite inferences are intended to be drawn. In the issue of March 27 an increase is alluded to as a myth. To me it appears to be a mathematical necessity.

The sound waves which generate hearing would, in a medium such as that of the endolymph or perilymph, be between 10 and 200 ft. in length, and if they passed through the cochlea would be virtually in the same phase on both aspects of the basilar membrane and produce equal pressure upon them. The movements of fluid which are universally recognized as the cause of the sensation are therefore in response to, and are not actual, waves. Presumably the same movements are produced by bone conduction.

A second opening, to permit of the movement, was one of the earliest features of the ear to be recognized as essential. In

the absence of such an opening hearing depends on the presence of an alternative provision to permit it. The only apparent alternative is expansion and contraction of the reservoir for fluid, that is of the bone, at the inner end of the scalae. Such expansion and contraction are the distinctive features of the vibration generated by sound and constitute bone conduction.

It appears to follow that if the scalae are the only outlet the movement of the fluid along them is greater, even if the increase is not recognizable, than if a second free opening such as the fenestra ovalis is situated between them and the reservoir to and from which the fluid moves.—I am, etc.,

Amersham, Bucks. H. MACNAUGHTON-JONES.

Rough Estimation of the B.S.R.

SIR,—While working in a field hospital in the Middle East during the war I attempted to devise a simple method of determining the B.S.R. without the use of laboratory apparatus. It was thought that the spreading of blood on filter paper might give an approximate estimate of the B.S.R. Tests were made and they showed that in a case of increased B.S.R. a distribution of serum and corpuscles occurred on the paper which was similar to the appearance of sedimentation in a tube.

In normal cases, when the B.S.R. was not increased, the blood appeared as a dark patch, only occasionally surrounded by a very narrow band of light-red serum, but this band was mostly not present. In cases of increased B.S.R. the corpuscles settled towards the centre and the dark-red corpuscular zone was surrounded by a band of serum. The wider this band the higher was the B.S.R.

The ordinary Westergren technique was employed and three drops of the citrated blood were placed on the filter paper. It was essential to prevent the blood-soaked part of the filter paper from touching the surface of a table and the like.

Some months after these observations had been made it became possible to study 100 non-selected cases and to compare the blood reaction on the filter paper with the blood sedimentation in tubes (Westergren). Of the 100 cases there were 21 in which the filter paper and the Westergren tube method did not correspond.

This paper test is crude and cannot compete with the accuracy of the different glass-tube methods; it is described only to show that such a crude and simple test may be of advantage under difficult conditions.—I am, etc.,

Malta. F. KRONENBERGER, Late Major, R.A.M.C.

Central Placenta Praevia

SIR,—A little clarification seems required on the subject of the medical memorandum by Mr. W. G. Mills (March 13, p. 500). The case described appears to be a type 3 placenta praevia (F. J. Browne, 1946) and not a true "central" or type 4, where no membranes are present lining the lower uterine segment. Rupture of the chorion and amnion at the lower edge of a type 3 placenta praevia seems a logical possibility, as is rupture of the scar tissue formed in a centrally positioned placental infarct over the cervical os in type 4 placenta praevia—such as occurred in at least two cases, and possibly a third, in 1947 at this hospital.

Case 1. Para 1. Thirty-eight weeks pregnant. History of intermittent bleeding throughout pregnancy. Admitted May 24, 1947, as an emergency with a transverse lie, the membranes being reported to have ruptured at 9.15 p.m. Liquor amnii containing vernix caseosa was seen to be draining in quantity per vaginam. The history, oblique lie, and inability to fix the head in the brim prompted the decision to examine under anaesthesia for suspected placenta praevia. On examination the cervix admitted a finger-tip; placental tissue covered the internal os completely, and liquor amnii was again seen to be draining. At classical section a type 4 placenta praevia was found. Apart from post-operative atelectasis the maternal convalescence was uneventful. The placenta in this case was normal, but centrally and over the internal os an infarct about the size of a half-crown piece was found—paper-thin and ruptured. The hole had unfortunately been worsened by trauma at removal, so that a true picture of the original rupture was not possible.

Case 2. Para 2. Aged 35. Thirty-seven weeks pregnant. Admitted June 30, 1947, in doubtful weak labour at 6.45 a.m. She was having feeble contractions, but owing to prematurity labour was not encouraged and she rested in bed. The presenting part was very high. Membranes reported ruptured at 8.30 a.m. on July 1. Liquor amnii containing vernix caseosa was seen to be draining per vaginam. With failure of the head to engage in spite of rupture of membranes, together with the appearance of slight bleeding, placenta praevia was suspected. On examination under anaesthetic two-finger dilatation was found and rough placental tissue felt at the cervix. Lower segment caesarean section was performed and type 4 placenta praevia revealed. The placenta was extremely adherent to the lower segment, particularly to the area around the internal os. Profuse haemorrhage required packing of the lower segment, the pack being removed 24 hours later with further pieces of adherent and fibrosed placental tissue. Post-operative examination of the placenta was impossible owing to trauma. Convalescence was uneventful.

Case 3. On May 20, 1947, a week before the first case was admitted, classical section for type 4 placenta praevia was performed on a patient—para 0, 36 weeks pregnant—who had been under close observation for antepartum haemorrhage of 8 weeks history. Details of exact findings were not recorded, unfortunately, but the sister in charge of labour wards reported that she suspected the membranes to have ruptured.

Three cases of type 4 (central) placenta praevia were treated within a short space of time at this hospital. All were confirmed at operation, and in two of the cases scarring and infarction of the placentae were found opposite the internal os. Local placental death and infarction, with organization of and adhesion with blood clot, are surely logical sequences in the pathology of placenta praevia. It is considered quite possible for this scar tissue to be thinned and ruptured with uterine contractions, especially when a thin placenta is encountered. Liquor can then drain to allow pressure to be effected on the bleeding site by the presenting part. Is not this surely Nature's method of dealing with her own abnormalities?

I am indebted to Dr. Joyce Morgan for permission to quote these cases.

—I am, etc.,

Hillingdon County Hospital, Middlesex. JOHN PRICE.

REFERENCE

Browne, F. (1946). *Antenatal and Postnatal Care*. London.

Health of Students

SIR,—I was very interested in Dr. John Pemberton's article on the health of 407 new students (March 13, p. 490) but am puzzled as to his reasons for one of his conclusions. When dealing with dental cases he states, "It seems probable that financial considerations had prevented some of the students from the poorer social groups from obtaining dental treatment." Now in the larger groups of men students (over 20) most were ex-Service and could have had free dental treatment. Those under 20 and the women under 20 in the poorer social groups were eligible as school-children for free or almost free treatment, and for the short period between school-leaving and call-up there are hospital clinics, insurance benefits, etc.

On what grounds, therefore, does Dr. Pemberton draw his conclusion that financial considerations prevented these students from obtaining treatment? In view of the finding that dental caries was the chief cause of defective health (73%) I think it important to know.—I am, etc.,

Lee-on-Solent, Hants. EMILY A. C. WILSON.

Mass Radiography and General Practice

SIR,—I was most interested in Dr. H. Bolton Tipler's letter (March 20, p. 570) setting out the incidence of differing types of illness among 3,200 patients seen by him during 12 weeks in midwinter, and hope that he will publish records for a similar period in midsummer. His figure of 23.5% for the proportion of patients suffering from disease of the respiratory tract is illuminating, as one of the suggested supplementary uses for mass miniature radiography is the examination of persons referred by their doctor because of symptoms of chest disease. It would be instructive to know, (1) how many of his patients Dr. Tipler would have referred for fluorography if facilities had been available, and (2) how many had pulmonary tuberculosis.—I am, etc.,

Denham, Bucks. W. POINTON DICK.

POINTS FROM LETTERS

Tell the Public

Dr. T. C. COTTON (Brandon, Suffolk) writes: Doctors have complained that they have had a "bad Press," but candidly they have only themselves to blame if they omit to explain to the public, who after all are the judges, why the honest part of the profession refuse to handle the State Health Service scheme unless it is suitably amended to safeguard the interests and private lives of the community.

Alternative Service

Mr. J. C. A. RAISON, B.A., writes: In spite of an overwhelming vote against the National Health Service Act in its present form, and against working it, the new service will inevitably come into action on July 5 unless the medical profession takes the immediate step of propounding an alternative scheme. The public are impressed by the Act, have been grossly misled by the Minister, and those whose support may be the most vital to us, the panel patients, are certain to condemn when on the appointed day they are called upon to make payment to the doctor who refuses to accept the Service. It is very necessary that a single explanation should be made available through the Press to all persons that there will be no change of facilities or treatment on July 5; that only 10d. of the new moneys collected is contributed to the medical services. Thus to the majority of the public supporting the Act the Service will be merely a continuance of the panel system; and to the economic level next above them no better nor cheaper facilities than existing contributory benefits schemes, etc.

But, far more important, an alternative service must be put forward in full detail by the Representative Body. . . . One further attempt to negotiate over the present Act will be the downfall of our profession. An eloquent Minister, adamant Government, credible public, and security-seeking blackleggers on July 5 will bring the Act into force. The force must be ours, Sir. A more rational service, suited to the needs and possibilities of the moment which we are prepared to offer, must of necessity be accepted when we refuse to work the Minister's structure. . . . If it seems impertinent that an unqualified student should write so dogmatically of these matters to his seniors and teachers, I would say that I took up the study of medicine not merely because of what I wished to do in the cause of healing, but also because I should be following a profession in which I was essentially free, bound to none, and therefore in the course of my increasing experience the better able and more impartially to be guide, adviser, and confessor to my patients as well as their doctor. This service threatens my vocation more greatly than it does any of my qualified brethren; should it come into force, they at least will have loved and lost; I shall never have loved at all.

Hardship of Consultants

"CADUCEUS" writes: . . . We are told that the Spens committee in considering the future remuneration of consultants will allow for the fact that the fledgling specialist will start to earn a reasonable income at a much earlier stage in his career. Not having had to mortgage his future during a dozen or so lean years of postgraduate apprenticeship he will naturally be able to pay reduced expenses and keep up appearances on a little less income. But what of the younger consultants whose sacrifice has already been made, who have been through the years of penury, and are now trying to meet inflated expenses out of almost non-existent incomings, whose future was long ago mortgaged to the limit upon a basis of very different expectations? Are they to be paid no more than the newer men who will earn something reasonable from the start? Would it be fair to pay £68,000,000 in compensation to general practitioners and not a penny to those men whose loss may well be so much greater? . . . My plea is that the younger, particularly ex-Service, specialists who reached consultant status before the introduction of the Health Act, but who are still economically unestablished, should be a special case for consideration by the Spens committee and that some form of retrospective compensation should be awarded to them for the loss of their prospective earning power to help them to meet what now threaten to be their crippling mortgages.

As a postscript I would add that a hospital patient upon whom I recently operated for nothing let fall in conversation that last year he had earned £4,000. Presumably such occurrences will soon be commonplace.

Consultants and the Act

Mr. HUGH DONOVAN (Birmingham) writes: If by any chance significant changes can be made in the Act, I suggest the following deserve attention: The separation of the university group of hospitals from the regional groups to cease. There can be no such thing as a medical school *in vacuo*, and medicine must be taught on medical treatment as it is at its best in a big busy centre. To isolate the medical school and to develop outside it all the new and growing special departments of medicine is to separate the university from the growing points of clinical work. Furthermore, the limitation of the university hospital to 1,000 beds defeats the object for which the region was created, centring on the teaching hospital. The solution is to allow a properly constituted regional board to administer both groups of hospitals. . . .

An Unusual Injury

Dr. REX GLENNY (Warrenpoint, Co. Down) writes: An unusual injury resulting from a fall from a bicycle may be worthy of record. A little girl of eight was riding an old bicycle the pedal of which comprised the pedal spindle only. A bag hanging on the handle-bar caught on the front wheel and she fell off, falling across the machine. The only injury she sustained was caused by the blunt-nosed pedal spindle, which penetrated her vagina a distance of 2½ in., ripping the hymen and the posterior vaginal mucosa. A few sutures repaired the damage, and the local and general sulphanilamide therapy resulted in a complete cure in about ten days.

When I saw her at first I immediately suspected rape, but her father and two sisters were witnesses of the accident.

Penicillin and Blood Coagulation

Dr. K. V. ADALJA (Nairobi) writes: With reference to the case reported by Dr. H. M. Desai (Jan. 31, p. 224), I would like to record a similar experience. My patient had melaena, probably from duodenal ulcer. Recognized treatment including rest, restriction of all food by mouth, vitamins C and K, etc., failed to help. It was decided to try penicillin on the plea of possibility of secondary sepsis keeping up the haemorrhage. 40,000 units four-hourly were given and the condition cleared up in a day.

This was not the first time that penicillin helped in this case. In 1946 the patient had melaena and at that time also penicillin was the only drug that proved useful.

Inhibition of Dental Caries by Fluorine

Dr. ROBERT N. C. MCCURDY (East Rudham, Norfolk) writes: I was very interested to read the report (March 13, p. 511) of the meeting of the Section of Odontology of the Royal Society of Medicine on this subject. While on a visit to New Zealand in January, 1942, I suggested to the Director-General of Health that the high incidence of dental caries in that country might be due to lack of fluorine in the soil. The idea was not taken up at that time so far as I know, but I continued to raise the question at every opportunity. . . .

Herpes Zoster and Varicella

Dr. DUDLEY A. IRELAND (Shrewsbury) writes: Further to the correspondence in your columns about the relationship between herpes zoster and varicella, three weeks ago I saw a woman, aged 45, who after three days' pain over her right chest developed herpes zoster, with a fourth thoracic nerve distribution over the right side of her chest. The lesions were painted with collodion. Four days later she became pyrexial and the following day she developed a typical varicella, with lesions on her body and face, and later on her head.

Convalescence was uneventful, with no residual post-herpetic pain but with some permanent scarring from the herpes. She had never previously had varicella or herpes, and as far as she knows had not been in contact with anyone suffering from either of these diseases recently.

Ocular Tests for Death

Dr. E. HAYLING COLEMAN (Wolverhampton) writes: In the recent notes on ocular tests for death I have not seen mention of an exceedingly simple one. If the ball of the eye be gently pressed between the thumb and forefinger and the pupil becomes irregular and loses its circularity, it is a sure sign of death. I saw this mentioned in an old book on forensic medicine—my father told me he had often found it of use and I have frequently employed it. . . .

Training in Accountancy

Dr. E. J. R. PRIMROSE (Glasgow) writes: One of the gaps in medical education which, although important to the doctor, seems to have attracted little attention is the business side of general practice. We emerge from the M.B. machine with very little knowledge of filing systems, case recording in G.P., income tax as it affects the G.P., medical contracts, practice loans, third-party insurance, and the economics of dispensing. As most medical students are destined to become general practitioners, surely it would not be too much to ask for a short course of instruction on the business management of general practice to be included in the final year of the medical curriculum and to be given by an experienced G.P. with the assistance of a chartered accountant. . . .

Obituary

C. A. MOORE, M.S., F.R.C.S.

When Clifford Arthur Moore died at the age of 69 on March 16 after a long illness surgeons in Bristol lost a stalwart and conscientious colleague. He was educated at Malvern College and University College, Bristol, qualifying in 1903 with the conjoint diploma, and graduating M.B., B.S.Lond. in 1905. His interest swung to surgery, and in 1908 he obtained the F.R.C.S. and the London M.S. After holding several resident posts he was appointed senior resident officer at his old hospital, the Bristol General Hospital. It was in this post that his sterling qualities first became evident. In 1913 he was appointed assistant surgeon.

During the first world war Moore served on the staff of the 2nd Southern General Hospital and also in France as officer in charge of the surgical division of the 56th General Hospital. Returning to civilian life he was soon appointed surgeon to the Bristol General Hospital, a post he held until the outbreak of the second world war. After the amalgamation of the Bristol General Hospital and Bristol Royal Infirmary as the Bristol Royal Hospital, he helped nobly, although due for retirement, with the heavy work of the hospital until the onset of his last illness in 1944. During the war Moore also took on a great deal of work at Cossham Memorial Hospital and Southmead Hospital. Moore's hospital work was characterized by his extreme sense of duty. He was a rapid and brilliant operator and took his full share of teaching. He was a clinical lecturer in surgery and also demonstrator in surgical anatomy in the University of Bristol. As a diagnostician he was unrivalled. No operating list was too long for him to finish, and for many years he did his full share of night emergency work. No man has served his hospital more fully than he did.

In addition to his hospital work and his private practice Moore found time to act as a vice-president of the Medical Defence Union for many years, rarely missing a meeting. A member of the B.M.A. since 1909, he was the representative for the Bristol area on the Consultants and Specialists Group Committee from 1934 to 1936. He leaves a widow and three sons, to whom his colleagues in Bristol extend their sympathy.—D. G. C. T.

Dr. ALBERT ALEXANDER ATKINSON, director of medical services at the limb-fitting service headquarters of the Ministry of Pensions, died on March 2 at the age of 60, after an illness of a few hours' duration, in Queen Mary's Hospital, Roehampton. A student of Edinburgh University, he graduated M.B., Ch.B. in 1911, and began his medical career as a partner in a practice in the Leeds district. On the outbreak of the first world war he joined the Royal Army Medical Corps and served in the Middle East. He was severely wounded on the Salonika front, as a result of which he suffered a high amputation of the left leg. He was fitted with his first artificial limb at Roehampton in 1918, but his military service was not ended through this misfortune. He transferred as a medical officer to the Royal Air Force, and on demobilization with the rank of major he became a limb surgeon on the staff of Queen Mary's Hospital, Roehampton, and subsequently medical superintendent of that institution. In May, 1925, he left Roehampton on transfer to the Ministry of Pensions as medical director of the Limb and Appliances Branch, which position he held to the day of his death. The suffering he experienced following the loss of his leg and pain which continued on and off for the rest of his life were known only to his closest intimates. He refused to permit his personal difficulties to interfere in any way whatever with the work he had so much at heart, which was the well-being of those who had, like himself, suffered the loss of a limb. His duty to his patients, his colleagues, and to the service always came first, earning the deep respect of all with whom he came into contact. A lover of nature, a keen fisherman, and a great sportsman in every sense of the word, he will ever be remembered with affection and respect by all those concerned with the welfare of the disabled.

Dr. HERBERT EDWIN MIDDLEBROOKE died on March 2 at the age of 65 after a short illness. He qualified from the London Hospital in 1908, and until the outbreak of the 1914–18 war was in general practice at Long Bennington, Lincolnshire, and held a part-time appointment as medical officer of health for the Claypole Rural District. During the war he served with the rank of captain in the R.A.M.C. Taking the D.P.H. at Liverpool University in 1918, he was appointed assistant medical officer of health for the Borough of Chorley, and in 1920 became medical officer of health and school medical officer. There he greatly advanced the child welfare service, and among other innovations successfully established a highly efficient ultra-violet ray clinic, one of the first in this country. Becoming seriously crippled with rheumatoid arthritis complicated by an ununited fracture of the femur following an accident in 1932, he resigned his appointment and retired to Southbourne, Bournemouth, and latterly lived at Friars Cliff, near Christchurch. He was a keen philatelist and formed an exceptionally valuable collection of early English postage stamps. In his early days he became an expert amateur conjurer and will be remembered by his colleagues of the London Hospital and others for the great pleasure he gave with his entertainments for patients and in connexion with various institutions and charities. He is survived by his widow.—C. C. M.

Dr. D. OWEN WILLIAMS died on March 8 at his home in Glandovey, Cardiganshire, at the age of 77. Dr. Williams was a student of Leeds University and graduated M.B., Ch.B. in 1899. He served in the South African War under General Baden-Powell and General Plumer. After the war he established a large practice in his native district, and was for many years medical officer for the Talybont mines. He was a member of the Aberystwyth Rural Council and was responsible for securing many improvements at Tre'rddol. He was a member of the Dovey, Mawddach, and Glaslyn Fishery Board, and one of the chief supporters of the Talybont Agricultural Show. Dr. Williams was a devout churchman and had served for many years as a churchwarden in Llancynfelin Church.

Dr. ANGUS DALRYMPLE SMITH died at a Glasgow hospital on March 12 at the age of 47. He was educated at Durham School and Edinburgh University, where he graduated M.B., Ch.B. in 1926. He held resident appointments as house-surgeon on the surgical wards and in the out-patient department at Edinburgh Royal Infirmary. He was also senior house-surgeon to the Sunderland Infirmary, and to the Sussex Maternity and Women's Hospital at Brighton. He took the Edinburgh F.R.C.S. in 1931. Dr. Smith came to Richmond fourteen years ago and entered into partnership with Dr. C. B. Whitehead. In 1937 he was appointed honorary assistant surgeon to the Memorial Hospital, Darlington, giving up this appointment in 1941 owing to ill-health. He had been in charge of the obstetric and gynaecological clinic, this being a subject in which he was particularly interested. He was also associated with the Victoria Hospital and with Richmond House. Dr. Smith was held in high regard by his many patients and friends in Richmond and the surrounding district. At his funeral on March 15, in the parish church, there were more than three hundred mourners. The rector, the Rev. W. Stuart Macpherson, in a moving address said: "The presence of so many who knew and had come to love Dr. Smith was in a sense sufficient tribute to his memory. There could be few homes in Richmond which did not at one time or another, in the past fourteen years, know of his quiet and reassuring efficiency in time of crisis or anxiety, and of his readiness to put himself and his skill wholly at their service, no matter at what inconvenience to himself. In Dr. Smith they felt they had not only a family doctor of outstanding knowledge and ability, he was a great friend, and his very coming across the doorstep brought confidence and hope. He did not deal with cases but with people, and many a desperately sick person's face would light up at his coming."—C. B. W.

Dr. HUBERT JAMES NORMAN, who died on March 13 at the age of 67, was a Devonian by birth, but his school and university days were spent in Edinburgh, where he was president of the Union. After graduating M.B., Ch.B. in 1905, he acted for a time as assistant to Alexis Thompson at the Royal Infirmary. The lectures of Prof. Clouston at Morningside attracted him to the study of morbid psychology. After holding two temporary posts in mental hospitals he was appointed to the staff at Camberwell House in 1908, and became medical superintendent there in 1925. Few men had a greater knowledge of the gradual development of the treatment of insanity; researches into demonology up to the present era occupied much of his leisure time. Dr. Norman was also interested in drug addiction, and had only just vacated the post of president of the Society for the Study of Addiction. He was fond of books and a keen bibliophile. In his early days Norman was a rugger man, and later a good squash and lawn tennis player.

Perhaps he will be generally remembered for his fine balance of judgment; the pros and cons were so carefully weighed that he never jumped at a conclusion, and thus, as an expert witness, his testimony was valued by the court. An old member of the Authors' Club, he met and held as friends contemporary writers. He was a modest man and he never spoke evil of any, and eulogized others' attainments.—F. H. E.

Mr. ARTHUR NORMAN HOOPER died in Kirkcudbright on March 23, after a short illness, at the age of 59. He was educated at Mill Hill School and at Cambridge, where he graduated in 1920, taking the F.R.C.S. in the same year. He served in France in the R.A.M.C. in the 1914–18 war, and afterwards started in general practice in Caversham, near Reading. Within a few years, through his outstanding ability and unremitting care for his patients, he built up a large practice. In 1924 he was appointed surgical registrar to the Royal Berkshire Hospital and served the hospital subsequently as honorary surgeon and gynaecologist until his retirement in 1946. He was secretary of the Reading Division of the British Medical Association for nine years. He was good at all ball games and keen on all outdoor sport, but seldom had time to indulge in games except when on holiday. He never spared himself, and during the last war, when surgeons were so much needed, he undoubtedly wore himself out. His quiet, retiring nature and his amazing fund of sympathy endeared him to all. —E. V. B.

Dr. W. P. S. Branson writes: May I supplement your formal notice of the death of JOHN WILFRED NUNN (March 13, p. 526) with a few lines of affectionate reminiscence. Gay, warm-hearted, lovable—how faithfully do these gracious adjectives reflect the man and his infinite capacity for endearing himself, and how well did we all learn this who served with "Monkey Nunn" at the Duchess of Westminster Hospital at Le Touquet during the first world war. His small, light frame and springy step seemed expressly designed to further a natural aptitude for sports, especially lawn tennis and cricket. He was, besides, the lucky owner of a delightful baritone voice and had a facility for the stage which made him, out of hours, a precious possession for patients and unit alike; while all his professional ministrations were warmed and vivified by the friendly heart behind them. He was the kind of man who could not fail to be, as all the best among general practitioners are bound to be, part protector and part priest to the patients upon whom he spent himself, and his memory will be safely housed in many abiding places.

Dr. W. Stanley Sykes writes: About thirteen years ago I was Dr. PERCY LUND POLLARD'S anaesthetist for eighteen months. He was a G.P., a panel doctor, and he would come into the Royal Halifax Infirmary and do operating lists of major surgery. His range was very wide. It was nothing unusual for him to do a cholecystectomy, a hysterectomy, a prolapse, and an orthopaedic case in a morning's list. He was an astonishingly good surgeon—and my standard of comparison was a high one, for at that time I was giving anaesthetics for Lord Moynihan and for several other whole-time surgeons of repute. I would like to pay my tribute to a very talented and competent man.

Medico-Legal

CUMULATIVE INJURIES AT WORK

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

The Court of Appeal recently considered another of those difficult cases in which a workman claimed compensation for an injury which had developed gradually. The Workmen's Compensation Acts speak of personal injury by accident arising out of or in the course of the employment. Does this apply to a condition which is due to the employment but has taken so long to make itself felt that it cannot be said to have been caused by an "accident" in any ordinary use of the term? The courts, always anxious to apply the Acts beneficially to the workman, have often ruled that it can so apply.

A typical example was in the case,[1] heard not long ago, in which the workman had been employed to hold a vibrating electrical tool tightly in the left hand, and had eventually suffered from Raynaud's disease. The court said that each vibration was an infinitesimal blow to the hand and arm, transmitted to the nerves, causing an infinitely small damage to their tissues, and in the end cutting off the flow of blood needed to keep the hand in a healthy condition. The mere fact that the breakdown did not occur until the cumulative effect of the tiny blows from the vibrations produced a certain degree of alteration in the nerves did not affect the character of the cause.

In the latest case[2] a workman who habitually used a pneumatic drill in a mine developed an inguinal hernia. A doctor called by the employing firm maintained that a hernia appearing for the first time was always accompanied by pain, and this workman had felt none. He admitted, however, that any intra-abdominal pressure must tend to aggravate a hernia, and that every time the man used the machine there would be a slight aggravation of the condition. The county court judge rejected the man's claim, saying that in many years of experience the burden of proof which he had required had been that the hernia must be shown to have protruded simultaneously with some effort by the workman. There had not been the usual severe physical pain, and he rejected the evidence of the two doctors, one for the workman and one against him, that the use of the machine had contributed to the onset of the hernia, as it was merely a matter of their opinion and was contrary to the volume of medical evidence he had had in previous cases.

The Court of Appeal held that the judge was not entitled to reject uncontradicted evidence in the case before him in favour of other evidence given in other cases. A physiological injury or change occurring in the course of a man's employment as the cumulative effect of a number of personal injuries was an injury by accident arising out of the employment, and the judge could have come to no other reasonable conclusion but that the workman was entitled to compensation.

[1] *Fitzsimons* v. *Ford Motor Co.*, 1946, 1 All E.R., 429.
[2] *Hughes* v. *Lancaster Steam Coal Collieries*, 1947, 2 All E.R., 556.

Universities and Colleges

UNIVERSITY OF OXFORD

A Radcliffe Fellowship has been awarded to J. M. Kenneth Marsh, B.M., B.Ch. He will spend at least one year in the United States of America.

UNIVERSITY OF CAMBRIDGE

The following medical degrees were conferred on March 13:

M.D.—P. E. C. Manson-Bahr, R. D. S. Rhys-Lewis.
M.CHIR.—*R. N. Jones.
M.B., B.CHIR.—*R. J. Dickson, *J. H. Inskip, *P. A. S. Hargrove.
* By proxy.

UNIVERSITY OF EDINBURGH

A series of lectures entitled "The Wider View of Medical History" will be delivered by Dr. Douglas Guthrie in the Physiology Classroom of the University on Tuesday, April 13, and Mondays, April 19 and 26, May 3, 10, 24, and 31, and June 7 and 14, at 5 p.m. The lectures are free to all matriculated students, staff, and graduates of the University and are open to others on payment of a fee of 10s. in lieu of matriculation. Details will be published in the diary column of the *Journal* week by week.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

At a recent examination the following medical practitioners were awarded the Diploma in Gynaecology and Obstetrics: Rose Allos, J. A. Beggs, M. Chaudhury, J. Cohen, R. K. Das, L. Haldar, S. R. Hing, K. M. Issa, A. Joffe, A. K. Kantarjian, C. M. Meyer, A. M. Porter, N. Ramadhani, E. Sheehan, S. M. Shukry, A. Skowron, E. M. Slattery, N. Sobhi, C. F. van den Steen, M. Stein, I. Youakim.

UNIVERSITY OF LONDON

On Feb. 19 the degree of Ph.D. in the Faculty of Medicine (non-clinical) was awarded to C. J. Hackett, M.D. (London School of Hygiene and Tropical Medicine).

Bernard Halley Stewart, M.D., and Hugh Alexander Dunlop, M.Sc., M.D., F.R.C.P., have been appointed Fellows of King's College.

The following members of the Senate have been appointed as members of Regional Hospital Boards under the National Health Service Act, 1946: *North-West*, Dr. G. B. Jeffery. *South-West*, Dr. Edith C. Baths and Mr. P. H. Mitchiner. *South-East*, Mr. J. B. Hunter and Mr. S. J. Worsley. The following representatives proposed

by the medical schools have been appointed: *North-West*, Dr. H. W. C. Vines (Charing Cross), Dr. H. E. A. Boldero (Middlesex), Miss Katherine G. Lloyd-Williams (Royal Free), Dr. D. H. Brinton (St. Mary's), and Prof. S. J. Cowell (University College Hospital). *North-East*, Prof. S. P. Bedson (London) and Dr. G. Graham (St. Bartholomew's). *South-West*, Mr. M. F. Nicholls (St. George's) and Mr. G. H. Macnab (Westminster). *South-East*, Dr. E. R. Boland and Lord Cunliffe (Guy's).

Prof. J. M. Mackintosh, M.D., F.R.C.P., has been appointed representative of the University at the Health Congress of the Royal Sanitary Institute to be held at Harrogate from May 24 to 28.

The following have been recognized as Teachers of the University in the subjects indicated in parentheses: *University College*, Dr. Mary F. Lockett (Pharmacology). *St. Bartholomew's Hospital Medical College*, Dr. F. T. Evans (Anaesthetics). *Guy's Hospital Medical School*, Dr. P. A. I. Gorer (Experimental Pathology). *St. Thomas's Hospital Medical School*, Dr. C. T. Maitland (Public Health). *Middlesex Hospital Medical School*, Dr. B. R. M. Johnson (Anaesthetics); Dr. M. Kremer (Medicine (Neurology)). *St. Mary's Hospital Medical School*, Dr. A. B. Anderson (Chemical Pathology). *Westminster Hospital Medical School*, Mr. D. W. Ashcroft (Oto-Rhino-Laryngology). *Royal Free Hospital School of Medicine*, Dr. Florence Louis (Morbid Anatomy). *University College Hospital Medical School*, Dr. W. Bentley Purchase (Forensic Medicine). *London School of Hygiene and Tropical Medicine*, Dr. David Long (Bacteriology and Immunology).

The following appointments at the Grant Medical College, Bombay, have been approved for the purposes of the M.D. examination, Branch II (Pathology): Assistant professor of pathology; assistant professor of bacteriology; clinical pathologist; resident pathologist.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examination indicated:

D.P.M.—*Part I*: N. P. Chamarette, N. A. Cohen, H. S. Coulsting, Barbara M. Dick, J. H. Kahn, M. M. Macrae, W. V. Wadsworth.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

M.CH.ORTH.—R. C. Anderson, K. T. Dholakia.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—R. Goldberg, H. S. Klein (with distinction), Henriette Lackner, A. A. Smith, Elizabeth M. Stokes.

FINAL M.B., CH.B.—*Part III (Medicine, Surgery, Obstetrics and Gynaecology, Therapeutics)*: *J. R. Bowker, *E. W. Green, *Kathleen Scott, *J. H. Shoesmith, *D. M. Williamson, N. V. Addison, T. Barker, Jeanne E. Boocock, Josephine J. Borman, J. D. Brackenridge, Elizabeth J. Brick, J. V. Chippindale, A. N. G. Clark, J. M. A. Critchley, Ilene I. Dunn, J. P. Falkingham, R. D. Haigh, R. I. M. Hepworth, R. High, T. B. Hogarth, A. J. Levine, T. K. Marshall, A. T. Merson, Joy A. R. Peniston, Sheila M. W. Pittock, M. S. Salinsky, D. M. Serr, W. M. Sutcliffe, K. H. Sykes, J. S. Washington, Isobel V. Watson, A. R. Webster, W. Wintersgill, Dorothy L. Wood. *Part I (Pathology and Bacteriology, Pharmacology)*: Norah E. Allen, Eileen Atkinson, R. S. Colwyn, E. L. Copley, Frances M. Cottam, Vivienne D'Andria, Ida J. Dawson, Sheila F. Dawson, J. H. DeGraeve, Audrey M. Emmerson, Edith Faulkner, G. V. Firth, W. P. Goodyear, N. S. Green, Patricia C. Jowett, H. N. Lewis, J. E. Miller, J. M. Pencheon, Cynthia M. Perlman, K. Platts, T. P. S. Powell, Elizabeth Pryce-Jones, P. J. Reynolds, J. Sagar, J. F. Scarlett, R. C. Spencer, Valerie A. M. Staunton, Doreen Steinbrecher, D. J. Stephens, Joyce M. Teasdale, P. W. Vallow, D. A. Ward, Jean M. Watson, Sheila M. Webster, J. S. Whiteley, Margaret Winton.

* With second-class honours.

The following scholarships, prizes, and medals have been awarded: *Medical Scholarship*, Betty Standeven. *Infirmary Scholarship and Littlewood Prize in Anatomy*, R. G. Burwell. *Hardwick Prize in Clinical Medicine*, Sheila M. W. Pittock. *Edward Ward Prize in Surgical Anatomy and McGill Prize in Clinical Surgery*, E. W. Green. *Waddington Prize in Anatomy*, G. Cust. *Birkett Prize*, Suzette M. Mettrick.

UNIVERSITY OF SHEFFIELD

The following appointments were made at a meeting of the University Council on March 19: *Lecturer in Child Health*, Spyros Doxiadis, M.D. *Assistant Lecturer in Physiology*, G. Wiseman, M.B., B.S. *Research Assistant in the Department of Pharmacology and Therapeutics*, A. G. Macgregor, M.B., Ch.B., M.R.C.P., F.R.F.P.S. *Demonstrator in Anatomy*, A. H. Morris, M.B., Ch.B.

The honorary degree of Doctor of Laws will be conferred on the Rt. Hon. Viscount Addison of Stallingborough, K.G., P.C., M.D., F.R.C.S., on July 2, on the occasion of the installation of the Rt. Hon. the Earl of Halifax as Chancellor of the University.

The following candidates have been approved at the examinations indicated:

M.D.—R. T. Gaunt.

M.B., CH.B.—*E. J. Clegg, *D. A. J. Tyrrell, Mary Austin, Margaret E. J. Bolsover, Barbara Briggs, E. Evans, Joan Ford, R. Harrison, J. A. Howarth, B. Humphries, Peggy C. Neill, Margaret M. Platts, Kathleen E. S. Pringle, O. H. Simms, C. M. Sutherland, V. C. H. Tyson, J. W. Warboys.

* With second-class honours.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

A series of 29 lectures in general medicine will be given at the College (Pall Mall East, S.W.), on various dates from May 3 to June 25, at 5 p.m. each day. The inclusive fee for the course is £7 7s. and the total entry limited to 200. The fee must be received at the College by April 19.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Faculty of Anaesthetists

At the request of the Association of Anaesthetists of Great Britain and Ireland, the College, acting under the powers granted in the new Supplemental Charter, has formed a Faculty within the College for those devoting themselves to the science and practice of anaesthetics.

The Faculty is governed by a Board, the members of which are as follows: Dr. A. D. Marston, Dean, Dr. Bernard Johnson, Vice-Dean, Dr. I. W. Magill, Dr. E. S. Rowbotham, Dr. C. Langton Hewer, Dr. R. E. Pleasance, Dr. W. Alexander Low, Dr. Frankis T. Evans, Dr. John Gillies, Prof. R. R. Macintosh, Dr. J. H. Challis, Dr. George Edwards, Dr. Katherine G. Lloyd-Williams, Dr. B. L. S. Murtagh, Dr. A. H. Musgrove, Dr. H. J. Brennan, Dr. Vernon F. Hall, Dr. R. F. Woolmer, Dr. G. S. W. Organe, Dr. T. Cecil Gray, Dr. E. A. Pask, with Sir Alfred Webb-Johnson, President of the College, and Sir Cecil Wakeley and Mr. L. E. C. Norbury, Vice-Presidents of the College, as *ex-officio* Members.

The Board held its first meeting on March 24, when future policy was discussed. It was decided to grant a Fellowship of the Faculty (F.F.A., R.C.S.) to those achieving distinction in the specialty. A dinner was held in the evening to celebrate the founding of the Faculty.

ROYAL COLLEGE OF SURGEONS IN IRELAND

J. B. Dunlop and P. J. van Miert have received the Fellowship of the College.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

Through the generosity of the Leverhulme Trust the Council of the College is in a position to grant two scholarships of £500 a year each, renewable for a second and third year, for the purposes of research into problems connected with obstetrics and/or gynaecology. The scholarships may be held simultaneously with another appointment if, in the opinion of the Council, sufficient time is available for research. Regulations governing these grants and forms of application can be obtained from the secretary, 58, Queen Anne Street, London, W.1. The last day for receiving applications on the prescribed form is July 1.

A postgraduate course of advanced lectures for those studying the special practice of obstetrics and gynaecology will be given in the College House (58, Queen Anne Street, London, W.) from Monday, April 19, to Friday, April 23, both dates inclusive, at 12 noon and 5 p.m. each day. The fee for the course of ten lectures is £4 4s. (10s. 6d. for a single lecture). Admission is by ticket only, obtainable from the secretary.

The Services

The King of Norway has conferred the following decorations in recognition of distinguished services in the cause of the Allies:

Commander with Star of the Royal Order of St. Olav.—Major-General D. T. Richardson, M.C., K.H.S., R.A.M.C.

King Haakon VII Liberty Cross.—Major-General J. A. Manifold, C.B., D.S.O., K.H.P., Brigadier (local) D. C. Monro, C.B., C.B.E., K.H.S., Colonel E. B. Allnutt, C.B.E., late R.A.M.C.; Colonels (temporary) F. A. Bearn, C.B.E., D.S.O., M.C., and E. I. B. Harvey, D.S.O., and Major (temporary) J. N. MacArtney, M.B.E., R.A.M.C.

King Haakon VII Liberty Medal.—Lieutenant-Colonel (temporary) G. M. Robertshaw, and Lieutenant R. W. Major, M.C., R.A.M.C.

Colonels I. G. W. Hill, O.B.E., T.D., and R. A. Lennie, T.D., have been appointed Honorary Colonels of No. 2 (Sc) General Hospital and No. 4 (Sc) General Hospital, respectively.

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W., on Friday, April 23, at 3 p.m., to elect six directors of the fund.

Medical News

Portrait of Dr. R. H. Hunter

On March 20 Dr. Richard Henry Hunter, Secretary of Queen's University, Belfast, from 1938 to 1947, was presented with a portrait of himself painted by Mr. James Gunn, R.P. Dr. Hunter gave the portrait into the keeping of Sir David Keir, the Vice-Chancellor, who promised to have it hung with the other pictures in the Hall. Mr. S. T. Irwin announced that the surplus of the money subscribed for the painting would be used to found a prize, bearing Dr. Hunter's name, in the Faculty of Medicine.

Sir Henry Dale Visits New York

Sir Henry Dale, F.R.S., has gone to New York to be present at the opening of the Cancer Research Institute.

South African Lectures

Under the joint auspices of the South African Medical Association, Post-Graduate Societies, and the University Medical Schools, Dr. S. Leonard Simpson has recently given a series of lectures on the adrenal gland and recent advances in endocrinology in Capetown, Johannesburg, and Durban.

Tropical Medicine

Because it is thought that the study of tropical diseases is important to medicine as a whole the proposal has been made in a recent issue of the *Journal of Tropical Medicine and Hygiene* that an association—perhaps named the Manson Association—should be established with the objects of improving methods of teaching, encouraging fellowship among workers in this field, and voicing the professional views of its members. In order to secure a wide range of opinion it is suggested that membership should not be confined to those engaged in teaching tropical medicine, but should include representatives from the teaching hospitals, medical schools, and universities, as well as from the Medical Research Council, the Forces, and the Colonial Office.

Presiding at Paediatric Meeting

Dr. Donald Paterson is visiting England this month to preside at the annual meeting of the British Paediatric Association.

Gynaecologist from Siam

Dr. Sayanha Vikasit, Siamese public health department official and lecturer on physiology in the Siriraj Medical School, is staying for six weeks in Britain under the auspices of the British Council to study maternity and child-welfare administration, for she wishes to reorganize this work on her return to Siam.

Scholarships at Foreign Universities

Scholarships for postgraduate study (not only medical) are being offered to British candidates by the governments of Belgium, Hungary, the Netherlands, and Sweden, the Swedish Institute, and the University of Teheran. They are intended to cover the cost of tuition and maintenance and, except for Hungary and the Netherlands, the cost of travel. Two scholarships each have also been offered by the Universities of Cologne and Munster, and negotiations with the Control Commission for Germany are proceeding. Full particulars may be obtained from the Controller of the Education Division, British Council, 3, Hanover Street, London, W.1.

Royal Photographic Society

At the annual general meeting of the Royal Photographic Society on March 9 Drs. Peter Hansell and S. D. Jouhar were elected members of the council of the society.

Atomic Research in Norway

A research station is to be built near Oslo to produce radioactive isotopes for use in medical and biological research. Though isotopes are obtainable from the U.S.A., the effective life of many is so short that they would lose their properties by the time they reach Europe.

Ophthalmological Surgery in Holland

The Ophthalmological Society of Great Britain is sending a party of ophthalmic surgeons to Holland in May to study Dutch methods.

Wills

Dr. Elizabeth Courtauld, of Halstead, Essex, late of the Zenana Mission Hospital at Bangalore, left £161,874. Dr. P. L. Giuseppi, formerly president of the Alpine Garden Society, left £5,261; Dr. Mary Janet Dodds, formerly a medical missionary at St. Margaret's Hospital, Poona, £33,084; Dr. Richard Pinhorn, of Tunbridge Wells, £15,652; and Dr. F. A. St. John, of Alexandra Park, Manchester, £1,740.

COMING EVENTS

Cantor Lectures

Dr. Frankis T. Evans will deliver three Cantor Lectures on "Recent Advances in Anaesthesia," before the Royal Society of Arts (John Adam Street, Adelphi, London, W.C.) on Mondays, April 12, 19, and 26, at 4.30 p.m.

Scottish Society of the History of Medicine

A preliminary meeting with a view to the establishment of a Scottish Society of the History of Medicine will be held in the library of the Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh, on Friday, April 23, at 5 p.m., when Dr. Douglas Guthrie will make a brief statement regarding the constitution and object of the proposed society, and Dr. Henry J. C. Gibson will read a paper on "The Early Days of Dundee Royal Infirmary."

Postgraduate Lectures in Ophthalmology

A series of lectures in ophthalmology will be given in the Department of Ophthalmology of the University of Glasgow on Wednesdays, May 5, 12, 19, and 26, at 8 p.m. Tea will be served after each paper and a discussion will follow. The meetings are open to all medical practitioners and senior students interested in the subject. Details will be published in the diary column of the *Journal* week by week.

Institute of Laryngology and Otology

Dr. Julius Lempert, of New York, will deliver a lecture on the fenestration operation at the Institute of Laryngology and Otology, 330–332, Gray's Inn Road, London, W.C., on Saturday, May 8, at 11 a.m.

Medical Art Society Exhibition

The annual exhibition of the Medical Art Society will be held at Walker's Galleries, 118, New Bond Street, London, W., from Wednesday, May 19, to Tuesday, June 1. Members are invited to submit works in oil, water-colour, pastel, black and white, or sculpture. Selection for hanging will be made by professional artists. Membership of the society is open to all medical practitioners interested in the visual arts, and the presence of non-exhibiting members will be welcomed at the annual dinner, the private view, and at the monthly instructional classes which are held during the winter months at the Medical Society of London, 11, Chandos Street, London, W., at 8 p.m. on the second Thursday of each month until, and including, May. The annual dinner, which will be held at Kettner's Restaurant, Romilly Street, London, W., on Tuesday, May 18, at 7 p.m., will be preceded by the annual general meeting at 6.15 p.m. and followed by the private view at the galleries. Further information may be obtained from the honorary secretary, Dr. Henry Wilson, F.R.C.P., 142, Harley Street, London, W.1.

Refresher Course for General Practitioners

The University of Leeds Postgraduate Committee has arranged a refresher course for general practitioners to be held during the two weeks beginning Monday, May 24. The fee for the course is £10 10s. (£5 5s. for one week). Applications for places in the course and for particulars of the financial assistance available (an applicant should state (*a*) whether he is a demobilized general practitioner within one year of release from the Forces, or (*b*) a doctor engaged in practice under the N.H.I. Acts) should be made to the Senior Administrative Officer, School of Medicine, Leeds, 2.

SOCIETIES AND LECTURES

Monday

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—April 12, 8.30 p.m. "*Recent Changes in the Treatment of Gangrene.*" Discussion to be introduced by Prof. A. M. Boyd and Mr. A. Dickson Wright.

ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, London, W.C.—April 12, 4.30 p.m. First Cantor Lecture on Recent Advances in Anaesthesia: "*The History of Inhalation Anaesthesia,*" by Dr. Frankis T. Evans.

Tuesday

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—April 13, 5 p.m. Lumleian Lecture: "*Clinical and Social Problems of Epilepsy,*" by Mr. F. J. Nattrass.

EDINBURGH UNIVERSITY: PHYSIOLOGY CLASSROOM.—April 13, 5 p.m. "*The Historical Background to Medicine,*" by Dr. Douglas Guthrie.

Wednesday

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—April 14, 10 a.m. *"The Treatment of Cardiospasm,"* by Mr. J. D. McLaggan.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—April 14, 3.30 p.m. *"The Opportunities of the School Medical Officer" (Illustrated)*, by Dr. R. E. Smith.

ROYAL SANITARY INSTITUTE.—At 90, Buckingham Palace Road, London, S.W., April 14, 2.30 p.m. *"The Hygiene of the Preparation, Storage, and Distribution of Food."* Symposium by members of L.C.C. staff. Paper to be read by S. G. Burgess, Ph.D.

Thursday

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—April 15, 5 p.m. Lumleian Lecture: *"Clinical and Social Problems of Epilepsy,"* by Dr. F. J. Nattrass.

BRITISH INSTITUTE OF RADIOLOGY.—At Reid-Knox Hall, 32, Welbeck Street, London, W., April 15, 8 p.m. Twenty-fifth Mackenzie Davidson Memorial Lecture: *". . . the Future comes apace, what shall defend the interim . . ." (Timon of Athens)*, by Sir E. Rock Carling.

CHADWICK TRUST.—At University College, London (The Architectural Theatre), Gower Street, W.C., April 15, 2.30 p.m. *"The Sanitation of Buildings,"* Bossom Gift Lecture by Thomas Ritchie, F.R.I.B.A., A.M.T.P.I.

EDINBURGH ROYAL INFIRMARY.—April 15, 4.30 p.m. Honyman Gillespie Lecture: *"Congenital Heart Disease,"* by Dr. A. Rae Gilchrist.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN: SCIENTIFIC AND TECHNICAL GROUP, 16, Prince's Gate, London, S.W.—April 15, 7 p.m. *"Speed and Contrast from the Standpoint of the Radiographer,"* by H. S. Tasker, M.A., B.Sc.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26 Portland Place, London, W., April 15, 7.30 p.m. *"Diseases of Tropical Origin as Seen in Captive Wild Animals,"* by Dr. R. E. Rewell. A discussion will follow.

Friday

BRITISH INSTITUTE OF RADIOLOGY.—At Reid-Knox Hall, 32, Welbeck Street, London, W., April 16, 8 p.m. Twenty-seventh Silvanus Thompson Memorial Lecture: *"The Structure of Biological Tissues as revealed by X-ray Diffraction Analysis and Electron Microscopy,"* by Prof. W. T. Astbury, Sc.D., F.R.S.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons, Lincoln's Inn Fields, London, W.C., April 16, 2.30 p.m. Diagnosis Section Meeting: *"Acute Mechanical Obstruction of the Small Bowel—Correlation of Roentgenological and Operative Findings,"* by Dr. Jack Spencer (Maine, U.S.A.).

ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, London, W.C., April 16, 5.15 p.m. *"Philosophy and Personal Commitment,"* by Prof. J. W. Harvey.

APPOINTMENTS

DUNDEE ROYAL INFIRMARY.—*Honorary Surgeon:* Walter Gordon Campbell, Ch.M., F.R.C.S. *Honorary Assistant Visiting Surgeon:* James Stirling Kinnear, F.R.C.S.Ed.

Mr. Campbell graduated at the University of St. Andrews in 1929, after taking his L.D.S. in 1928. He obtained the degree of Ch.M. in 1943, with commendation for a thesis on "Physiological Rest and Relief of Pain." He served in the R.N.V.R. before and during the recent war, holding the rank of surgeon lieutenant-commander, and he has published papers on the treatment of ankle fractures and the role of the sympathetic nervous system in segmental pain.

Dr. Robert A. Cumming, M.B., Ch.B., has been appointed to the joint position of Regional Director (S.E. Scotland) of the Scottish National Blood Transfusion Association and Director of the Association's Central Depot (Eastern Area) at Edinburgh, in succession to the late Dr. Douglas A. C. McRae.

Dr. Cumming qualified at Aberdeen in 1933, and until recently was acting as Government pathologist and professor of pathology in the King Edward VII College of Medicine, Singapore. From 1935 to 1938 he held a commission in the R.A.F. Medical Service, acting as pathologist to the Royal Air Force General Hospital in Iraq, and later joined the Colonial Medical Service's Department of Pathology at Singapore. Rejoining the Royal Air Force in November, 1941, Dr. Cumming acted as senior medical officer and later as pathologist in Java, until taken prisoner by the Japanese in 1942. He worked as a prisoner-of-war on the Siam–Burma railway until his release, and in April, 1946, was appointed professor of pathology at Singapore.

LOWE, J. J. H., M.D., M.R.C.P., D.P.M., Regional Psychiatrist, Leeds Regional Hospital Board.

Dr. Lowe qualified at Durham in 1931 and proceeded M.D. in 1935, taking the M.R.C.P. of both London and Edinburgh the following year. He has held appointments as Regional Hospital Officer of the Ministry of Health, and Medical Officer to H.M. Prison, Wandsworth, and has published papers on the psychology of rumour and evacuated difficult children.

David Brown, M.B., Ch.B., has been appointed to the Liverpool Regional Hospital Board.

John Alexander Scott, O.B.E., M.D., D.P.H., has been appointed Deputy Medical Officer of Health to the London County Council.

AITKEN, J. M., M.B., Ch.B., D.P.H., Medical Officer of Health, Perth.

ANDERSON, A. S. K., D.S.O., *M.C.*, M.B., Ch.B., D.P.H., to be Vice-chairman of the Yarmouth Executive Council of the National Health Service, in place of the late Mrs. E. K. Hill.

BLAKE, H. ELLIOTT, F.R.C.S., Honorary Plastic Surgeon, Royal Alexandra Hospital for Sick Children, Brighton.

BRADSHAW, D. B., M.B., B.Ch., D.P.H., Deputy Medical Officer of Health and Deputy Schools Medical Officer, Leeds.

CHESTER ROYAL INFIRMARY.—Visiting appointments. *Consultant Physician*, George A. Kiloh, M.D., M.R.C.P. *Consultant Dermatologist*, J. H. Twiston Davies, M.B., B.Chir. *Consultant in Thoracic Surgery*, H. Morriston Davies, M.D., M.Ch., F.R.C.S. *Consultant in Neurosurgery*, A. Sutcliffe Kerr, F.R.C.S.

CULLEY, A. R., M.D., D.P.H., Medical Member, Welsh Board of Health, Cathays Park, Cardiff, in succession to Dr. T. W. Wade.

FRIEL, WILLIAM RALPH NICHOLSON, M.B., Ch.B., Full-time Medical Officer to Birmingham Gas Department.

GRIFFITH, J. VAUGHAN, L.R.C.P.&S.Ed., Examiner to North-West Division First Aid Competitions of the National Coal Board.

MACKAY, ROBERT I., M.R.C.P., D.C.H., Visiting Honorary Assistant Physician, Duchess of York Hospital for Babies, Burnage Lane, Levenshulme, Manchester.

NICHOLSON, N. J., M.B., Ch.B., F.R.C.S.Ed., Consulting Surgeon, Lindsey County Council.

PARK, JOHN, M.B., Ch.B., Medical Superintendent, Falkirk and District Royal Infirmary.

ROBERTS, G. J., M.D., D.P.H., Medical Officer, Welsh Board of Health, Cathays Park, Cardiff.

TAUNTON AND SOMERSET HOSPITAL.—*Assistant Ophthalmic Surgeon*, K. J. Higham, M.B., B.S., D.O.M.S. *Second Radiologist*, M. McAlley, L.R.C.P.&S.Ed., D.M.R.

UNIVERSITY OF CAMBRIDGE.—The following appointments in the University are announced: D. Russell-Davis, M.D., Lecturer in Psychopathology, for three years from Jan. 1; J. W. Millen, M.D., Demonstrator in Anatomy, and B. M. Herbertson, M.B., B.S., Demonstrator in Pathology, both for three years from Oct. 1; M. M. Wilson, M.B., B.Chir., Demonstrator in Pathology, for five years from Oct. 1.

WILLIAMS, E. L., M.R.C.S., L.R.C.P., Deputy Medical Superintendent, Cleaver Sanatorium, Heswall, Cheshire.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clark.—On March 28, 1948, at Edinburgh, to Mary Rose (*née* Harris), wife of Dr. David Clark, a daughter—Pamela Ann.

Grove.—On March 25, 1948, at Hunstanton, to Helen, wife of William S. Grove, M.B., B.Ch., a daughter.

MARRIAGE

Kelsall—Miller.—On March 24, 1948, at Glasgow, Alan Robert Kelsall, M.D., M.R.C.P., to Margaret Hay Miller, M.B., Ch.B.

DEATHS

Barron.—Recently, Norman James Barron, M.B., Ch.B.

Bruce.—On March 19, 1948, at Edinburgh, Robert Bruce, M.B., Ch.B.Ed., late of 14, Rankeillor Street, Edinburgh.

Campbell.—On Easter Day, 1948, at The Laurels, Cupar, Fife, William Graham Campbell, LL.D., M.B., C.M.Ed., aged 84.

Coode.—On March 23, 1948, Claude Lionel Coode, B.M., B.Ch.

Douglas.—On March 19 1948, at Aberdeen, Robert Douglas, M.D.Glas., aged 76.

Evans.—Recently, Richard Cyril Stephen Evans, M.R.C.S., L.R.C.P., D.P.H.

Forde.—On March 27, 1948, at Worthing, Robert Michael Forde, L.R.C.P.&S. and L.M.Ed., late P.M.O., Sierra Leone.

Garland.—On March 19, 1948, at Brighton, Geoffrey Garland, M.R.C.S., L.R.C.P., aged 59.

Geffen.—On March 24, 1948, at 2, Frognal, N.W., Max Geffen, M.R.C.S., L.R.C.P., D.P.H.

Hooper.—On March 23, 1948, at Bells Barns, Kirkcudbright, Arthur Norman Hooper, F.R.C.S., aged 59.

Hunter.—On March 26, 1948, at 8, Queensborough Gardens, Glasgow, Alison Mary Hunter, M.B., Ch.B.Glas., F.R.C.O.G.

Johnston.—On March 23, 1948, William Henry Johnston, L.R.C.P.&S.I. and L.M., of 150, Junction Road, Tufnell Park, N.

Kirton.—On Feb. 20, 1948, Martin Ainger Kirton, M.R.C.S., L.R.C.P., formerly District Surgeon, Durban, South Africa.

Lawrence.—On March 20 1948, John Hereward Lawrence, M.B., B.S., D.P.H., aged 37.

MacGill.—On March 19, 1948, at Stockport, Andrew Maxwell MacGill, M.B., Ch.B., aged 47.

Morton.—On March 19, 1948, William Andrews Morton, M.D., of Brendan House, Birr, King's Co.

Murison.—On March 26, 1948, Alexander Logan Murison, M.R.C.S., L.R.C.P., of 389, Portland Road, West Hove, Sussex, aged 76.

Peebles.—On March 26, 1948, at a nursing home, Edinburgh, Alexander Spalding Mackie Peebles, M.D.Ed., Lieutenant-Colonel, I.M.S., retired.

Ratcliff-Gaylard.—On March 22, 1948, at West Herts Hospital, Hemel Hempstead, Herts, James Ratcliff-Gaylard, M.D., Officer of the Order of St. John of Jerusalem, aged 86.

Rendel.—On March 17, 1948, at 8, Ennerdale Road, Kew Gardens, Richmond, Arthur Bowen Rendel, M.B., B.Ch., late of Penlee, Postbridge, Dartmoor, S. Devon, aged 85.

Reynell.—On March 21, 1948, Walter Rupert Reynell, M.D., F.R.C.P., of 30, Springfield Road, London, N.W., and 87, Harley Street, London, W.

Rhind.—Recently, Ian Mitchell Rhind, M.B., Ch.B.Aberd.

Robinson.—On March 15, 1948, at Gordon Hospital, Westminster, James Herbert Robinson, M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., retired.

Stratford.—On March 27, 1948, very suddenly, at Franchise Farm House, Burwash, East Sussex, Howard Martin Stratford, F.R.C.S.Ed.

Wild.—On March 21, 1948, at Choisi, Guernsey, Henry Sydney Wild, M.R.C.S., L.R.C.P., aged 79.

No. 12

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 20.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1948					1947 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	49	5	23	1	3	114	10	33	11	—
Deaths		1	—				—	1		
Diphtheria	173	19	53	15	5	212	20	52	14	3
Deaths	—	—	—	—	—	3	—	—	—	—
Dysentery	170	17	30	—	1	48	—	17	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	1	—	—	3	—	1	1	1
Deaths		—					—			
Erysipelas			49	7	6			46	8	2
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				13					28	
Deaths	59	4	11	2	—	76	13	17	11	1
Measles*	10,034	1716	505	112	37	11,295	513	228	26	65
Deaths†			2	—	—	18	1	—	2	11
Ophthalmia neonatorum	92	5	9	—	—	57	3	18	—	—
Deaths										
Paratyphoid fever	2	1	—	1 (B)	—	6	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	963	53	7	5	5	1,035	68	13	12	5
Deaths (from influenza)‡	20	7	2	1	1	66	9	3	4	2
Pneumonia, primary			295	24				289	44	
Deaths	232	40		4	7		89			21
Polio-encephalitis, acute	2	—				1	—			
Deaths							—			
Poliomyelitis, acute	20	2	1	2	—	3	—	1	2	1
Deaths§	2	—					—			
Puerperal fever		1	14		—		1	15		1
Deaths										
Puerperal pyrexia‖	145	6	11	—	—	169	4	13	1	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,847	118	302	37	59	1,362	86	178	18	52
Deaths†			—	—	—	—	—	1	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	6	—	1	1	—	1	—	1	4	4
Deaths	—	—	—	1	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	3,304	246	61	46	10	2,277	230	354	83	12
Deaths	9	2	—	—	2	24	5	7	5	3
Deaths (0–1 year)	357	57	50	9	10	574	75	89	55	21
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,941	839	616	192	132	6,773	1100	846		186
Annual death rate (per 1,000 persons living)			12·4	12·0				17·6	23·3	
Live births	8,366	1347	1057	400	228	10,583	1627	1387		329
Annual rate per 1,000 persons living			21·3	25·0				27·9	22·0	
Stillbirths	222	33	27			272	28	42		
Rate per 1,000 total births (including stillborn)			25					29		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

EPIDEMIOLOGICAL NOTES

Anti-cholera Certificates in Turkey

All the measures taken by Turkey against cholera have now been withdrawn in respect of arrivals from Egypt and Syria, except the obligation to submit an anti-cholera inoculation certificate.

Plague in South Africa

The Department of Health of the Union of South Africa reports that, no cases of plague having occurred since Jan. 20 in the Parys District (Orange Free State), local quarantine measures have been lifted as from Jan. 28.

Discussion of Table

In *England and Wales* an increase occurred in the incidence of measles 1,585 and acute pneumonia 30, while decreases were recorded in the notifications of scarlet fever 180, whooping-cough 114, and dysentery 43.

The large rise in the incidence of measles was mainly confined to London and the surrounding counties; the largest increases were London 459, Middlesex 166, Hertfordshire 141, Essex 123, and Surrey 103, while the largest decreases were Lincolnshire 84 and Nottinghamshire 68. Small falls in the incidence of scarlet fever occurred throughout the country, the largest in Yorkshire West Riding 31 and Wiltshire 29. No change of any size occurred in the local trends of diphtheria.

The chief features of the returns for whooping-cough were falls in Warwickshire 78 and Surrey 71 and a rise of 72 in Essex. The largest rise in the notifications of acute pneumonia was 41 in Lancashire.

Of the 6 cases of typhoid 3 were notified from Leicestershire, Melton Mowbray U.D. The largest returns of dysentery were Lancashire 52 (Manchester C.B. 21); Yorkshire West Riding 30 (Sheffield C.B. 24); London 17; and Surrey 11.

The counties with multiple cases of acute poliomyelitis were Lancashire 3, Somerset 3, London 2, Essex 2, Cheshire 2, and Durham 2. The only administrative areas with more than one notification were Cheshire, Birkenhead C.B. 2, and Somerset, Williton R.D. 2.

In *Scotland* decreases occurred in the number of notifications of measles 109, dysentery 42, and scarlet fever 17. A small fall in the incidence of scarlet fever was fairly general. The largest exception to the general trend was a rise of 15 in the city of Dundee.

In *Eire* a fall was recorded in the incidence of diarrhoea and enteritis 23, primary pneumonia 14, and scarlet fever 13, while an increase occurred in the number of notifications of measles 34. A small rise in the notifications of measles was reported in most areas. The notifications of diarrhoea and enteritis were the lowest since February, 1946.

In *Northern Ireland* the notifications of scarlet fever increased by 13 despite a decrease of 14 in the outbreak in Belfast C.B.

Week Ending March 27

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,526, whooping-cough 2,603, diphtheria 154, measles 9,308, acute pneumonia 720, cerebrospinal fever 53, acute poliomyelitis 17, dysentery 136, paratyphoid 1, and typhoid 4.

The Council of the Royal Society of Arts (John Adam Street, Adelphi, London, W.C.2) announces that the next award of the Swiney Prize will be made in January, 1949, the one-hundred-and-fifth anniversary of the testator's death. Dr. Swiney left a sum of money to the society for the purpose of presenting a prize, on every fifth anniversary of his death, to the author of the best published work on jurisprudence. The prize is a cup, in normal times of the value of £100, but on this occasion of the value of £150, and money to the value of £100. The award is made by a joint committee of the Royal Society of Arts and the Royal College of Physicians of London, which appoints special adjudicators. The prize is offered alternately for medical and general jurisprudence, but if at any time the committee is unable to find a work of sufficient merit in the class whose turn it is to receive the award, it is at liberty to recommend a book belonging to the other class. On the last occasion of the award (1944) the prize was awarded for general jurisprudence. It will, therefore, be offered on the present occasion for medical jurisprudence. Any person desiring to submit a work in competition, or to recommend any work for the consideration of the judges, should send it to the secretary of the society by Nov. 30.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Alcohol in Life

Q.—*How should one set about determining the degree to which an individual is "under the influence" of alcohol? When the accused has been exposed to a recent injury, such as a car crash, what details constitute the strongest evidence in a court of law in support of the finding of alcoholic excess, assuming that the attitude of the defence will be that the signs elicited may have been caused by the shock? How significant is a raised blood alcohol and how should it be taken?*

A.—In examining an individual suspected of being "under the influence" of alcohol a doctor must bear in mind that his opinion may be used subsequently as evidence either in substantiating or in rebutting a criminal charge. It is necessary, therefore, to inform the individual accordingly, and to obtain his free consent to any examination made, after seeing that he appreciates his right to refuse examination if he chooses. In such cases suspicion has almost invariably arisen because of some degree of observed abnormality of behaviour. The purpose of the medical examination is to verify the presence of an abnormal condition and to determine whether it is due to alcoholic intoxication or not. The doctor's observations, tests, and interrogation are intended to detect the presence of mental and physical aberration and incoordination, which will not only reveal the presence of an abnormality but also indicate its degree, and therefore whether the individual is thereby unfitted for his occupation at the material time—usually being in charge of a motor-car. An opinion that alcohol is the cause of any abnormality detected must be based on the presence of an accumulation of evidence pointing in that direction, no single item of which may be conclusive in itself, and on the absence of features indicative of other causal agencies, such as head injury, disease, or other forms of intoxication. The replies to interrogation may be very helpful in this connexion, and the smell of alcohol in the breath is important, though by no means conclusive. The doctor's opinion should be entirely independent and unbiased irrespective of whether he has been called by the police or by the suspect. His examination should be made in private, and only his final opinion should be made known to the police. He should not provide additional information based on the results of his interrogation, as this may prove a source of further evidence, and it is contrary to law in this country to induce a suspected or accused person to furnish evidence against himself.

When the suspect has been involved in an accident it is often difficult to decide whether his abnormal condition is due in whole or in part to the accident or to the consumption of alcohol. Opinion must be based on a full consideration of the signs and symptoms presented by the individual, the presence or absence of injury and its site and severity, and the details of the accident itself. But though a case may be difficult the doctor should not evade the issue, and should give his honest opinion. He must remember that his opinion will be considered by the court in conjunction with all the other evidence in the case, and any reservations he may make will be given due weight.

The presence of alcohol in the blood is definite evidence that alcohol has been consumed, and evidence also of the minimum quantity which must have been consumed. But as individuals vary greatly in their susceptibility to alcohol it is not equally conclusive evidence of the degree of drunkenness in any given case. The blood-alcohol concentration is of great value, however, when taken in conjunction with the clinical findings, as evidence of the responsibility of alcohol for the individual's abnormal condition. For alcohol estimation a minimum of 2 ml. of blood (and preferably more to permit of repeated estimations) should be withdrawn by venepuncture and transmitted for examination without delay in an adequately labelled, closely sealed container that is of appropriate size for the quantity of blood withdrawn. It is possible, but less satisfactory as a routine measure, to make an alcohol estimation on a very small quantity of blood withdrawn into a capillary tube after pricking the finger. Whichever measure is adopted it is important to re-emphasize the necessity for the individual's free consent to the procedure, and the alternative possibility of a urine-alcohol estimation should be borne in mind.

Alcohol after Death

Q.—*Can reliance be placed on estimations of the alcohol content in the blood, urine, stomach contents, brain, and other organs after death? What methods can be used, and what fallacies are there?*

A.—In cases of sudden death, particularly when associated with accidental or homicidal violence, it is often of importance to ascertain whether, and to what extent, the deceased was under the influence of alcohol at the time of his death. For this purpose samples of blood and urine should be taken at post-mortem examination and subjected to analysis without delay. It may also be desirable to learn whether there is alcohol still in the stomach, and occasionally to determine the alcohol content of the brain or other organs. In general, however, it is usually sufficient to determine the blood alcohol, for the distribution of alcohol in the soft tissues of the body is fairly uniform, and the concentration throughout is very well reflected in the blood. The concentrations of alcohol in the blood and in the urine from the bladder may differ considerably, and it is possible on occasion to make useful deductions from such differences. If the samples are taken within two to three days of death—i.e., within the period during which a post-mortem examination will usually be made—estimations of alcohol are of value. With the onset and progress of putrefaction the interpretation of results becomes progressively more difficult. The alcohol in the blood may itself be broken down, and on the other hand the process of putrefaction is characterized by the formation of reducing substances, some of which may be volatile. No definite limits can be placed on the period during which post-mortem estimations of alcohol are of value. When indicated, they should be made irrespective of the time since death, but the longer the interval since death the more difficult and the less reliable will the interpretation be. If the body has remained frozen since death or shortly after, that will increase the length of time during which a reliable result is to be expected.

The method adopted for the estimation is by determining the quantity of volatile reducing substances present in a measured sample of blood. By means of a water-bath the volatile substances in the blood are distilled through an oxidizing mixture (usually potassium dichromate and strong sulphuric acid). A subsequent titration with sodium thiosulphate shows how much of the potassium dichromate has been required to oxidize the volatile reducing substances distilled into the mixture, and from this the amount of alcohol can be calculated. Reliable macro- and micro-methods are available the details of which can be studied in any textbook dealing with the subject—e.g., *Recent Advances in Forensic Medicine*, by Sydney Smith and Glaister, 1938. It must be realized, of course, that in these procedures all volatile reducing substances are included in the estimated "alcohol." Such substances do not normally amount to more than a few mg. per 100 ml., but in special circumstances—e.g., under anaesthesia and in conditions associated with acidosis—they may reach a high figure. Usually the special circumstances are sufficient to prevent a misinterpretation of the blood "alcohol" estimation, but the possibilities must be borne in mind. Apart from these sources of misinterpretation and the fallacies which may be associated with putrefaction, most errors are due to faulty technique, delay in transmission, faulty apparatus or reagents, and a failure to make repeated estimations, with "blanks," from each sample under investigation.

Chicken-pox and Herpes Zoster

Q.—*Have the contents of vesicles of chicken-pox and those of herpes ever been cultured, and, if so, with what result?*

A.—It is presumed that the question refers to herpes zoster. To eliminate confusion with herpes febrilis (simplex) the

tendency is to drop the prefix "herpes" here and refer only to "zoster." Though occasional successful transmission of these viruses to animals or the developing chick embryo has been reported no consistent results have been obtained. In 1944 Goodpasture and Anderson recorded one success out of several attempts at culturing zoster virus on human skin which had been grafted on the chorio-allantois. Fluid from zoster vesicles was placed on the prepared skin before it was grafted. Cellular reaction and acidophilic nuclear inclusions were found in the skin graft after four to eight days' incubation. There was no evidence of infection of the chick cells. Recently, Ritossa and Raicevich have claimed infection of the chorio-allantoic membrane with the development of specific lesions with varicella virus, but the work was not convincing. However, proof that the virus particles are present in the vesicle fluid has been obtained by microscopical examination and use of the fluid as antigen in complement-fixation tests with convalescent varicella or zoster serum.

Sacro-iliac Strain

Q.—*What are the symptoms of strain of the anterior part of the right sacro-iliac joint? What is the treatment?*

A.—In the past the term "sacro-iliac strain" has been used to cover a variety of clinical conditions characterized by pain in the lower back, buttock, or thigh. More recently, however, orthopaedic opinion on this subject has undergone modification, and there is now much scepticism regarding the part played by the sacro-iliac joints in the causation of these symptoms. For example, many of the cases formerly diagnosed as sacro-iliac strain would now be regarded as examples of a prolapsed intervertebral disk. Nevertheless it is probable that true cases of sacro-iliac strain do occur and that the condition exists as a clinical entity. The symptoms follow local trauma to the pelvis. Not infrequently they develop after childbirth. The main symptom is persistent pain of an aching character localized over the affected joint. The pain is often made worse by activity. It is felt mainly at the posterior aspect of the joint, probably because the strain involves the sacro-iliac ligaments—which are in the main posterior to it—rather than the joint itself. It is doubtful whether a strain of the anterior ligamentous fibres can be recognized as a distinct clinical entity. On examination there is local tenderness on deep palpation over the posterior sacro-iliac ligaments. Torsional strains applied to the trunk while the pelvis is fixed cause increased pain.

Treatment should not be started until other causes of low back pain and buttock pain have been excluded by clinical, radiological, and, if necessary, serological examinations. If the symptoms are relatively mild a course of physiotherapy, including short-wave diathermy and intensive active spinal exercises, may be successful in giving relief. If this proves inadequate it is frequently of benefit to manipulate the sacro-iliac joints under anaesthesia: this is one of the conditions in which manipulation is often followed by quite dramatic improvement. In cases which do not respond satisfactorily to these measures reliance must be placed on giving support to the region of the joint either by means of a plaster girdle or by a reinforced sacro-iliac belt. In correctly diagnosed cases there is a tendency for gradual spontaneous improvement to occur.

Amenorrhoea in Glass-cutters

Q.—*Are there any occupational hazards which would give rise to amenorrhoea in women employed in glass-cutting factories? A patient who cuts glass with a carborundum stone in an optical instrument factory has had amenorrhoea for five months. Gynaecologists can find no cause for the amenorrhoea. The patient knows of no case of poisoning at the works: a continuous spray of water prevents dry dust being inhaled. On physical examination there is no abnormality apart from cyanosis of the hands and feet, with a tendency to chilblains. She has no cough and has not lost weight. A radiograph of the chest showed no abnormality and the blood count was: red cells, 4,680,000 per c.mm.; haemoglobin, 93% (14.4 g. %); colour index, 1.01; white cells, 4,000.*

A.—There is no specific hazard in glass-cutting which would give rise to amenorrhoea. Neither the age nor the period of employment of the patient is mentioned. It is sometimes found that workers who have recently started menstruating may on first employment in a factory become irregular for a while, but generally, with an improved economic position, with its nutritional advantages, and the benefit of canteen meals, the reverse of this picture is more common. As the total white blood cell count is low, the possibility of exposure to benzene particularly or xylene (which are used sometimes in optical instrument manufacture) should be checked, even though the girl may not actually be employed on such a process.

Calcium and Vitamin D in Fractures

Q.—*Do calcium and vitamin D aid the calcification of bone in cases of fracture? I have a patient with a crush fracture of the spine; one surgeon recommends calcium and vitamin D and another says it is no good.*

A.—Under normal conditions of nutrition there is no rational basis for the administration of calcium and vitamin D in cases of fracture. The level of calcium in the blood is kept at a constant figure of 9–11 mg. per 100 ml. by a delicate regulator mechanism in which the parathyroid glands play an important part. The calcium absorbed from a normal diet is quite adequate to maintain this level without calling upon the reserves of calcium in the skeleton. The calcium content of the blood is not significantly raised by an increase of calcium in the diet; moreover, even if this were achieved an increased blood calcium level would not accelerate the healing process going on in the fracture haematoma, where the concentration of calcium, largely derived from the bone ends, is already at a very high level.

Crush fractures of the spine unite readily and consolidate satisfactorily provided that immobilization is continued for an adequate period, usually about four months. Delayed union or non-union is not a problem which affects these fractures, probably because there is an adequate blood supply to the fragments and because shearing strains across the fracture line do not occur.

Libido at the Menopause

Q.—*Is a gradual decrease in libido the first sign of the onset of the menopause in women over 40? Is there any drug, preparation, or technique which will help to maintain libido in a woman of this age?*

A.—In each decade of adult life in both sexes a slight lessening of libido is to be expected. Contrary to popular belief the menopause itself causes little significant change in libido in the majority of women. Fatigue, monotony, and boredom are more important factors in most cases; advice should therefore usually be directed along these lines. Reassurance is often sufficient, but if the husband's demands are exacting the wife can be advised to accept coitus passively, only attempting to respond on occasions when she feels so inclined. With the exception of alcohol, treatment by aphrodisiacs is disappointing. It is exceptional for oestrogens to affect libido—certainly they are valueless to the ordinary "frigid" woman—and in any case their prolonged use would be contraindicated. Many women get assistance from the local use of a non-greasy surgical lubricant.

Vitamin D in Arthritis

Q.—*Is there any difference between vitamin D obtained by electrically activating ergosterol and that obtained from ergosterol by ultra-violet irradiation? What is the dosage of vitamin D in arthritis? Does it produce any beneficial effects?*

A.—Irradiation of ergosterol results in the formation of calciferol, or vitamin D_2, and if the process is not controlled a number of other products are formed by the degradation of ergosterol, such as lumisterol, tachysterol, and toxisterol. It was the presence of certain of these products, some of which are toxic, which caused harmful side-effects in the early days of vitamin-D therapy, when crude irradiated ergosterol products were used. Vitamin D_2 can also be formed by the electrical activation of ergosterol (Whittier process), which avoids the formation of lumisterol and toxic by-products. There are several reports in American medical literature on the beneficial effect of massive doses of vitamin D (200,000 to 300,000 units daily) in the treatment of arthritis. According

to the American Rheumatism Association and the Council on Pharmacy and Chemistry of the American Medical Association the therapeutic effects are very doubtful. The treatment is dangerous, as the continued use of vitamin D in high doses can cause metastatic calcification, renal failure, and changes in the central nervous system. Several deaths have been reported in patients given massive doses of vitamin D.

Pethidine in Trigeminal Neuralgia

Q.—*Has pethidine hydrochloride been used for trigeminal neuralgia, and with what results? Apart from morphine, is any other drug of real help? Can you give percentage of successes by alcohol injection?*

A.—Pethidine has been used, with some degree of benefit, in cases of trigeminal neuralgia. Gelsemium certainly helps to some extent, also perhaps nicotinic acid. The percentage of successes after an injection of alcohol depends upon the skill of the operator. If the nerve is successfully located, then relief for a period up to eighteen months is to be anticipated. The present-day tendency in the treatment of trigeminal neuralgia is more and more in favour of section of the sensory root of the Gasserian ganglion.

Generalized Pruritus

Q.—*What is the most effective treatment for generalized and severe pruritus? There is little or nothing to be seen on the skin, and the usual palliatives are ineffectual. Is this a common condition, and what are the causes?*

A.—Generalized pruritus without physical signs is certainly common, and to discuss causes would require the greater part of this journal. A textbook should be consulted. Treatment turns upon an accurate diagnosis. Attention should be directed towards the exclusion of parasites (scabies and pediculosis), diabetes, renal disease (impending uraemia), blood changes (anaemia and leukaemia, etc.), carcinoma (especially stomach or lower bowel), arteriosclerosis (affecting central nervous system), menopausal and senile endocrine disturbances, deficiency diseases, hypertension, etc. The affection is most often the expression of a psychoneurosis. Local treatment, including antipruritics such as tar and *x*-ray therapy, is of secondary importance.

Diabetes Mellitus and Heredity

Q.—*Glycosuria was discovered in a patient in 1944, when he was in the Services. A diagnosis of diabetes was definitely established in May, 1947. He has one child, born in 1942, and is very anxious to have further children. What is the risk of any subsequent children developing diabetes? There is no family history of diabetes.*

A.—Diabetes mellitus is not always inherited in the same way, nor is there agreement as to the usual mode of inheritance. Some observers believe that a recessive gene is involved, others that it is dominant with a rather low rate of expression. As the family history is negative in this instance the chance that any child of the marriage may develop diabetes at some time during his or her life is not in all probability larger than 1 in 10 and may well be considerably less. It does not seem to be a risk that should deter this couple from having more children.

Test for Albumin in Urine

Q.—*What is the procedure for the sulphosalicylic acid test for albumin in the urine? Do you consider it as reliable for an antenatal clinic as the "heat" test?*

A.—A few drops of a saturated solution of sulphosalicylic acid are added to about 10 ml. of urine in a test-tube; alternatively, two or three volumes of a 3% solution are added to one volume of urine. The formation of a white precipitate indicates the presence of albumin. Cloudy urines should be filtered first. It is a reliable test, probably even more sensitive than the "heat" test, and is widely used in routine clinic work because it is quick and less troublesome to carry out. It gives a positive reaction with nucleo-proteins and proteose as well as albumin and globulin, and it is the custom in some clinics to carry out a confirmatory heat test on those urines which give a precipitate with sulphosalicylic acid.

Resistance to Upper Respiratory Infection

Q.—*What is the relative importance of fatigue and exposure as compared with a dose of the infecting agent in upper respiratory infections in man? In the light of recent scientific knowledge, can you tell me if draughts and wet feet play any part in increasing susceptibility to these infections? Has it ever been proved that a reflex congestion of the respiratory mucosa by chilling the feet increases the liability to clinical infection? Has it been proved that fatigue or general debility make one more liable to these infections?*

A.—Few clinicians of experience would question the importance of fatigue and exposure in reducing resistance to infection. The difficulty is in assessing their significance by "scientific methods." They are not susceptible of exact measurement, and it is not easy to reproduce such conditions in a form suitable for laboratory experiment. Recently there has been so much emphasis on the infective agent that secondary factors in the causation of infections have been greatly neglected. Many years ago it was shown that chilling the body surface led to vasomotor changes in the mucosa of the upper respiratory tract, but how far such changes increase susceptibility to infection remains uncertain.

NOTES AND COMMENTS

Scrotal Eruption.—Dr. D. F. REES (Twickenham) writes: With reference to the question and answer under this heading (March 20, p. 583), in the absence of any other diagnosis the description of a chronic scaly irritating eruption confined to the scrotum exactly fits a vitamin-B deficiency manifestation. If such, it will solve rapidly with appropriate therapy.

Piercing the Ears.—Dr. NORMAN H. SMITH (Edinburgh) writes: With reference to the remarks of Dr. H. Maitland Moir (March 27, p. 626) I think that the method I employ is simpler and more effective. It is evident that if a needle is used to pierce the lobule the wounds of entrance and exit and that through the intervening adipose tissue do not remain in the same straight line, and it is almost impossible to thread the delicate ring through without breakage at the joint.

To obviate this difficulty a fine trocar and cannula is used and plunged through the anaesthetized lobule. The trocar is withdrawn, and the end of the opened ring is inserted in the mouth of the cannula and pushed through the ear. The cannula falls out and the ring can be locked at leisure. All this can be done in a matter of seconds. Failure is impossible.

The rings supplied nowadays are often of inferior workmanship and are liable to break at the joints if there is any fumbling or force used in their insertion. The above method puts no strain on the joints whatsoever.

Vitamin B and Growth of Hair.—Dr. J. G. BRANDON BRAVO (Amsterdam) writes: My wife was released in 1946 from a Japanese camp, and I found her to be suffering from pellagra. I have been treating her with injections of a proprietary preparation containing vitamin, riboflavin, nicotinamide, pyridoxin, and pantothenic acid. When I started the treatment, my wife's hair was thin, without lustre, and grey. At present, after roughly two years, her hair is glossy, thick, and only slightly grey. . . .

Correction.—In our obituary notice of Dr. Charles H. Rivers (March 20, p. 574) reference was made to his five sons "of whom one is a doctor." Mr. Nigel Rivers informs us that he is a medical student and not yet a doctor.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.